SportsTurf MANAGERS ASSOCIATION

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SAFE
The Foundation for Safer Athletic Fields

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March – May

Having a healthy spring green up is dependent on the condition the field was left the previous fall, weather conditions, and maintenance practices. Proper cultural practices will benefit your field and lead to a healthy, safe playing surface.

Mowing

Recommended mowing heights:

	March	April	May
Kentucky bluegrass	1.5-3 in Should not exceed 3.5 inches	1.5-3 in Should not exceed 3.5 inches	1.5-3 in Should not exceed 3.5 inches
Perennial ryegrass	1.5-3 in	1.5-3 in	1.5-3 in
Tall Fescue	2-3.5 in Should not exceed 5 inches	2-3.5 in Should not exceed 5 inches	2-3.5 in Should not exceed 5 inches

Mowing heights should be based on the turfgrass variety. Certain varieties can tolerate lower mowing heights compared to some common types that are unable to thrive at lower heights.

Frequency

Mow as often as needed so that no more than 1/3rd of the leaf blade is removed in a mowing event. During cooler temperatures in March and the beginning of April, fields may only need to be mowed once per week. Warmer temperatures throughout April and May will increase turf growth and the field may need to be mowed 2-3 times per week. Maintaining a low height will increase the density of the turf and improve wear tolerance of the field for spring sports.

Special Considerations

- Rain
  - o In the event of excessive rain, mowing should be avoided to prevent rutting and compaction.
- Extreme temperatures
  - o Avoid mowing in the middle of the day if temperatures exceed 90°F as this may cause damage to the turf. High daytime temperatures rarely occur in March and April, but may become an issue in May.
  - o Avoid mowing (and turf use in general) when there is early morning frost. Traffic on frosted turf ruptures leaf blades and the damage will likely be visible into the following spring.

1/3 Rule

A general rule when mowing any stand of turfgrass is to remove no more than 1/3 of the total leaf surface at one time.

Effects of removing more than 1/3 of leaf surface:

- Negatively affect photosynthetic production of food
- Deplete carbohydrate reserves in the plant roots
- Graying or browning of leaf tips
- Root growth restriction
- Weed encroachment
- Increased susceptibility to damage from pests, environmental extremes and traffic
- Excess clippings

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Photo courtesy of Jerad Minnick

Direction

Change direction each time the field is mowed. This promotes upright growth and can reduce wear from equipment continually following the same pattern. Mowing the same direction creates 'grain' and the wavelike ridges affect the speed and direction of ball roll.

Clipping Collection

Clippings typically will not need to be collected if the turf is being mowed on a regular basis using the '1/3rd rule.' However, variables such as weather conditions, season of the year, soil fertility, moisture conditions, growth rate of the turfgrass, and the surface playing characteristics of the sport sometimes require clipping collection. Collect clippings if they are so long and excessive that they negatively impact turf playability and/or turf health (i.e. blocking sunlight, increasing disease activity under the piles, etc.).

Benefits of returning clippings:

- Research at Penn State University shows that over a 3 year period, Kentucky bluegrass clippings returned 46-59% nitrogen to the plant.
- Clippings contain nutrients that act as a fertilizer for the turf. Microbes in the soil hydrolyze the clippings into a solution that plants are capable of using.
- Clippings comprised of leaf blades break down rapidly and do not contribute to thatch when removing no more than 1/3 of the leaf blade and clippings do not clump.

Negative effects of excessive clippings:

- Smother grass
- Provide ideal environment for disease and insects

Equipment

No matter what type of equipment is used to cut the turf, maintaining a sharp blade is the most important element to have a healthy, well groomed, aesthetically pleasing turf.

Reel Mowers

- Provide the best cut for turf mown under 2 inches
- Cut grass with a scissor or shearing action where there actually is slight metal to metal contact. Blade and bedknife sharpness is important.
- Can cause longer grass to lay over
- Safer option to bystanders in comparison to rotary mowers – blade revolves slower and debris is rarely projected
- Require careful maintenance to keep adjusted and sharp

Rotary Mowers

- Provide the best cut for turf mown over 2 inches
- Cut grass using impact. Speed of blade rotation combined with blade sharpness cuts the turf. If blade is not sharp, fraying may occur.
- Blades revolve at high speed and may project objects from beneath the deck.

Flail Mowers

- Typically used on utility turf mown over 2 inches but improved models can be used on athletic fields
- Cuts grass by series of spinning, levered blades in a self-contained deck. Since blades are free-spinning, they 'give' if they strike a solid object and chances of blade breaking and being discharged are negligible.
- Ideal to use in park-like settings where sticks and other debris might exist as bystander safety is enhanced by the blade and deck design.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Irrigation

Recommended amounts per week (minus any rainfall):

March	April	May
1-1.5 in/week (weather dependent)	1-1.5 in/week	1-1.5 in/week

Rootzone

It is important to know the soil physical properties (water infiltration rate, compaction, soil texture, soil structure, infiltration, water holding capacity, and soil drainage) of your rootzone to establish a successful irrigation program. Native soil rootzones containing high amounts of clays and/or silt typically have high water holding capacity. Sand based rootzones have little water holding capacity and may percolate water very quickly. Soils that have good aggregation permit more rapid infiltration than a soil with poor structural properties. If a soil is compacted, aggregation is reduced or absent. Compaction at or near the soil surface can greatly reduce the rate of water infiltration.

Irrigation System

It is important to know water output and uniformity of the irrigation system. This information can be obtained by hiring a certified irrigation auditor to inspect the irrigation system, or by conducting a simple irrigation audit yourself. Knowing the output in inches per hour can increase efficient water use and provide the correct amount of water to fields.

Photo courtesy of Jerad Minnick

Frequency

Water should be applied on an as needed basis. The proper amount of water to apply at any one time is dependent on water holding capacity of the soil, grass species, soil texture, climatic condition (rainfall, humidity, temperature, and wind movement), exposure, intensity of use, drainage and amount of moisture present when irrigation is started. Most turfgrasses require between 1-1.5 inches of water per week during their active growing period to remain healthy and resilient. When natural precipitation is not sufficient, irrigation is essential to maintain the health of turf and if appropriately managed, a soil surface that still provides desirable footing characteristics with reduced surface hardness. Irrigating supports active growth and helps maintain turf's green color. It is necessary for photosynthesis, plant and environmental cooling, and plant rigidity. Properly irrigated turf also helps decrease weed encroachment and tolerates insect and disease pressure.

Always water at the first sign of wilt. Wilt is characterized by folded or curled leaves, blue-green color, and visible footprints left after the walking on the surface. Wilted turf recovers quickly if it is watered immediately. Traffic should not be allowed on wilted areas or recently recovered wilted areas.

Amount

To establish a successful watering program, the depth of the rootzone must be known. Deep, infrequent irrigation that wets the entire rootzone (generally 4 inches in depth) leads to the healthiest turf.

Deep and infrequent

- Leads to the healthiest plants
- Promotes development of deep, strong root systems that can extract water from a large volume of soil

Light and frequent

- Leads to weak, unhealthy plants
- Promotes shallow root systems
- Turf can become susceptible to algae, moss, and disease
- Light and frequent is only acceptable when establishing grass from seed or sod or forcing growth with nitrogen fertilizer. When establishing turf, because seedlings are very susceptible to drying out, the seedbed should not be allowed to dry. These areas require irrigation 2-4 times daily

depending on weather conditions. The amount of water applied should only moisten the top 1.5-2 inches of the soil profile. Once germinated seedlings reach 2 inches in height, begin shifting the irrigation strategy to deep and infrequent watering and prepare to mow the turf as the soils are dried.

Handwatering

- Some areas may be prone to drying out more quickly than other areas and may need to be supplemented by handwatering to extend the interval between watering events
- Areas that are exposed or excessively fertilized may need up to ¼ inch of water daily

Weather conditions also affect the amount of water needed to sustain healthy turfgrass. In hot, dry, windy, and sunny conditions, more frequent irrigation is needed to make up for water lost to evaporation and transpiration. Turfgrasses vary in total amount of water required for growth, plus the amount of water transpired from the plant and evaporated from both plant and soil surface. Cool season turfgrasses typically lose more than .4 inches of water per day to evapotranspiration. (In comparison, warm season grasses lose about .25 inches of water per day.) High air temperature, low relative humidity, wind, growth rate, aerial shoot density, leaf area and leaf position all influence the amount of water lost by a turfgrass plant. Temperatures in March and April rarely require an increased need for irrigation. As temperatures and growth start to increase in May, turf may have higher water requirements.

Drought

If athletic fields do not have access to irrigation or you are facing a water ban or restrictions, allow fields to go dormant. Dormant fields should be watered once every four weeks during a drought. Fields will recover from dormancy as long as traffic is very limited.

Timing

Early morning is the best time to water your turf.

Early Morning

- Between 4:00 am and 9:00 am is the best time to water.
- Reduced water loss to evaporation due to lower temperatures, less sunlight, and lower wind velocity
- Reduced disease potential by minimizing the duration of leaf wetness
- Depending on water source, municipal water demand is lower

Midday

- Not an efficient time to water because water lost to evaporation is at its greatest potential
- Midday watering can be effective if the goal is to temporarily cool plant temperatures and reduce heat stress. Syringing is a very light application of water applied to the turf leaf surface that cools the turf so it can get through the hottest part of the day.

Evening/Night

- Irrigating should be avoided during these hours.
- Excessively wet plants in the evening can remain wet throughout the night and make a favorable environment for fungal diseases.

Consequences of Over Irrigating

Do not irrigate at a rate faster than the soil can absorb. Once the rootzone is wet, additional water simply runs off the surface, wasting a valuable resource and potentially moving nutrients and chemicals in the surface flow. What is considered excess water is dependent on soil properties: water infiltration rate, compaction, soil texture, soil structure, infiltration, water holding capacity, and soil drainage.

Over watering can lead to:

- Poor turf health
- Increased weed, disease and insect problems
- Open, sparse stand invaded by moss and algae
- Poor appearance
- Runoff and/or leaching of nutrients and pesticides
- Anaerobic soil conditions
- Standing water
- Compaction
- Surface ruts

Managers should avoid applying water in large volumes all at one time and watch that irrigation patterns are adequately dispersed.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Photo courtesy of Chad Price, CSFM

Consequences of Too Little Irrigation

- Poor turf health
- A gradually thinning turf leading to increased pest problems
- Shallow root system
- A hard playing surface that can impact player safety

Fertilizer

Recommended amount of nitrogen per month:

	March	April	May
Kentucky bluegrass	0.25-1 lb. soluble N / 1000 sq ft	0.25-1 lb. soluble N / 1000 sq ft	1.5 lb. insoluble N / 1000 sq ft
Perennial ryegrass	0.25-1 lb. soluble N / 1000 sq ft	0.25-1 lb. soluble N / 1000 sq ft	1.5 lb. insoluble N / 1000 sq ft
Tall Fescue	0.25-1 lb. soluble N / 1000 sq ft	0.25-1 lb. soluble N / 1000 sq ft	1.5 lb. insoluble N / 1000 sq ft

Soil and Tissue Testing

Soil tests should be conducted on a routine basis – every one (sand-based fields) to three (native soil fields) years is recommended. A soil test will analyze nutrient requirements, pH, phosphorus and potassium levels, and will provide the best guide to fertilization to maintain or achieve a healthy field.

Tissue tests are a great diagnostic tool in that they provide a snapshot of nutrients present in the plant at the time the sample was taken. However, their real value is realized if conducted simultaneously with a soil test since only the soil report can provide clues as to why a nutrient deficiency or toxicity is occurring.

Frequency

Applications in March and April can aid in winter recovery and stimulate spring green up. Applications in May can help with recovery from spring sports damage. Excessive applications of nitrogen in the spring causes increased shoot and leaf growth and has little effect on root growth. Reduced root growth leads to weaker plants and reduced stress tolerance to summer temperatures. Plants are also more susceptible to disease, weed, and insect problems. Excessive top growth also requires more frequent mowing. Therefore, based on soil test recommendations, spring fertilizer applications should be limited and well planned to meet the nutrient needs of your athletic fields.

Photo courtesy of Jerad Minnick

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Nutrients

The macronutrients required for turfgrass growth include nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), and sulfur (S).

Nutrient effects on turfgrass growth and health:

- Nitrogen – Influences color, shoot growth, shoot density, root growth, rhizome and stolon growth, carbohydrate reserves, high temperature stress, cold tolerance, drought resistance, wear tolerance, thatch accumulation, disease susceptibility and recuperative potential.
- Phosphorus – Involved in transfer and storage of energy for metabolic processes in turf. Affects seedling development, maturation, root growth and seed production. Needed during establishment. Phosphorus has been eliminated in many fertilizers due to potential environmental concerns. Also, soil that already has adequate phosphorus, does not need any additional from a fertilizer application. This is one reason why soil tests are necessary.
- Potassium – Involved in photosynthesis; Important in the regulation of stomates and internal water management; Maintain turgor pressure in plants; Affect root growth, heat, cold and drought tolerance, wear tolerance, disease susceptibility, and environmental stress resistance
- Calcium – Aids in cell wall structure and new cell formation; Stimulates root and leaf development
- Magnesium – Involved in formation of proteins; Found in chlorophyll molecule; Improves P uptake from soil; Aids in plant respiration
- Sulfur - Involved with formation of proteins; Helps with turf growth, green color, shoot growth and density, root growth, carbohydrate reserves, and disease susceptibility

The micronutrients required for turfgrass growth include iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), boron (B), molybdenum (Mb), chlorine (Cl), nickel (Ni). Adequate amounts of micronutrients are usually present in the soil as long as pH is appropriate. Excess amounts of these nutrients are more commonly seen than deficiencies. Deficiencies are much more likely in sand-based soils than heavier textured native soils.

Lime

Lime should only be applied in accordance with what is recommended on soil test results. If recommended amounts exceed 50 pounds per 1000 square feet, apply in split applications. Proper liming is as important as fertilization. Properly managed soil pH regulates nutrient availability and creates a soil environment not only desirable for turf, but also for healthy soil microorganisms.

Rootzone

Nutrient holding capacity of a rootzone varies depending on soil texture. Heavy, fine textured soils hold more nutrients than light, sandy soils. A rootzone with low nutrient retention is often best managed with light and more frequent fertilization unless water insoluble fertilizers are applied. Use tissue and soil tests to determine the amounts and application frequency needed to maintain a healthy turf environment.

Products

Quick release products are water soluble and cause a turf response in a week or less. These products are generally inexpensive, but have increased leaching and leaf burn potential if used improperly. Application should always either be planned before a rain event or followed with irrigation to prevent turf burn.

Slow release products are water insoluble and provide a gradual, sustained turf response over a period of 3-10 weeks or more. Slow release products normally require sufficient moisture, optimal temperatures (above 55° F) and/or microbial activity (or most often a combination of the three) to release the intended nutrient or active ingredient. The time of year in which these products are applied can be critical for their success. These products are generally more expensive, but rarely burn leaf blades.

Make sure to check with your local and state agencies for any restrictions on applying nutrients. For areas with restrictions on inputs or other management program constraints or objectives, there are organic and microbial products available in the marketplace. STMA encourages you to talk with vendors and practitioners for recommendations to fit your specific needs.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Equipment

Rotary spreader

- The most rapid way to apply product as fertilizer is distributed in a wide pattern.
- Holes in the bottom of the hopper drop granules on to a rotating impeller that slings granules in a pattern wider than the spreader.
- Distribution is not uniform and is more concentrated in the middle of the pass.
- To achieve uniformity, on each pass, granules should reach the wheel path of the previous pass.
- Splitting the application in half and applying material in two directions can help eliminate striping.

Drop spreader

- A very precise way to apply product as fertilizer is distributed by only the width of the hopper.
- A row of holes across the full width of the bottom of the hopper releases granules.
- Distribution is uniform across the width of the spreader.
- To achieve uniformity across the entire area, run the tire just inside the track from the previous pass.
- Splitting the application in half and applying material in two directions can help eliminate striping.

Plant Growth Regulators (PGRs)

Recommended time for application:

March	April	May
	X	X

For best results with PGRs, be conscious of the grass species it is labeled for, how the product affects the plant, how the product enters the plant, and if water is necessary following application. Never apply PGRs to grass that is under stress.

Benefits

- Suppression of vertical top growth of desirable turfgrasses. Lateral spread of growth is unaffected.
- Improved recuperative potential.
- Management of Poa annua growth and development.
- Poa annua seedhead suppression.
- Improved color.
- Increased density.
- Reduction of clippings.
- Enhanced establishment.
- Deeper roots.
- Larger food reserves.
- Beneficial for conversion programs when transitioning from one type of grass to another during overseeding programs.
- Shift of plant carbohydrates to crowns, stems and roots may increase rooting and tillering.
- Rebound – when turf reaches the end of the time period that PGRs are active within the plant, there is a surge of growth. Although also considered a disadvantage, if timed appropriately, the rebound can help recovery from traffic. Document applications so you can time the rebound effect.
- Potential cost savings in certain cases by reducing fuel, equipment, and labor costs over the course of a growing season.

Photo courtesy of Chad Price, CSFM

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Types (listing of a product by STMA is intended for information purposes only and is not an endorsement of the product)

- Class A – Late Gibberellic Acid Synthesis Blocker
  - o Entry – Foliar
  - o Mode of Action – Prevents cell elongation, promotes lateral growth, provides short periods of growth suppression activity
  - o Products - trinexapac-ethyl

- Class B – Early Gibberellic Acid Synthesis Blocker
  - o Entry – Roots
  - o Mode of Action – Inhibits cell elongation, promotes lateral growth, generally provides longer periods of growth suppression compared to class A
  - o Products – paclobutrazol, flurprimidol

- Class C – Mitotic (Cell Division) Inhibitors
  - o Entry – Foliar or roots
  - o Mode of Action – Inhibits differentiation in meristematic regions, suppresses vegetative growth and seedhead development
  - o Products - mefluidide

- Class D – Herbicides
  - o Entry – Foliar or roots
  - o Mode of Action – Herbicides used at low rates can suppress growth or seedhead development, inhibit growth and development through interruption of amino acid synthesis or fatty acid biosynthesis
  - o Products – glyphosate, ethofumesate

- Class E – Plant Hormone Generator
  - o Entry – Foliar
  - o Mode of Action – Generates ethylene, a hormonal regulator inside the plant which causes seedhead suppression
  - o Products – ethephon

Disadvantages

- Phytotoxicity – most products cause discoloration to the turf. This is not permanent and in some cases may be hidden by nitrogen applications.
- Cost – products are expensive, but the benefits provided by PGRs may outweigh the costs.
- Rebound – when turf reaches the end of the time period that PGRs are active, there is a surge of growth. Document applications so you can time reapplication to avoid the rebound effect.

Cultivation

Recommended time for soil cultivation:

March	April	May
X (dependent on weather conditions)	X	X

On cool season grasses, fields should be cultivated when turf is actively growing and the rootzone has dried from thawing and spring precipitation. Vertical mowing in early spring may aid in opening the canopy and help with spring green up. Fields should be hollow or solid tine cultivated at least once in the spring and once in the fall. Monthly or more frequent cultivation will benefit the turf, especially heavy traffic areas, as long as the fields are not under too much stress or temperatures are not consistently higher than 80°F. More aggressive types of cultivation should be done according to field needs.

Benefits of Soil Cultivation

- Physical penetration of the soil improves air, water and nutrient movement within the rootzone.
- Corrects or alleviates soil compaction. This is especially important for high traffic areas such as goal mouths. It may be necessary to cultivate these areas 6-8 times per year.
- Improve water infiltration.
- Improve gaseous exchange between the soil and atmosphere.
- Reduces thatch.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Equipment

Hollow tine

- Aerator pulls soil core (3/8 – ¾ inches in diameter) from a 2-6 inch depth.
- Helps minimize thatch and improves water penetration
- For best results, fields should be core cultivated twice a year with high traffic areas receiving it 4-6 times per year.
- This is an effective practice when done with renovation and reseeding.
- Soil cores can be removed or reincorporated into the rootzone using a dragmat.

Photo courtesy of Chad Price, CSFM

Solid tine

- Solid tines penetrate through the rootzone with minimal surface disturbance
- Increases initial water infiltration rate
- Effective way to plant seed with minimal disturbance to grass and soil stability
- An ideal tool to utilize during periods of intensive field use, but it does not substitute for overall benefits of core aeration.

Shatter coring

- Solid tines aggressively penetrate the soil and fracture belowground compaction zones at a depth up to 6 inches
- Promotes deep rooting, assists in removal of standing water, increases initial water infiltration rate
- Effective for planting seed and improving soil properties with minimal disturbance to the surface and soil stability

Water jet coring

- Streams of pressurized water penetrate thatch and loosen soil to promote root growth
- Effective way to cultivate stressed turf in unfavorable weather conditions
- Promotes deep rooting, increases water infiltration rate
- Minimal disturbance to the surface; does not substitute for overall benefits of core aeration

Slicing

- V-shaped knives mounted on disks attached to a slowly rotating steel shaft cut into the turf
- Blades sever stems of creeping grasses (i.e. bermudagrass and Kentucky bluegrass) and promote additional lateral growth
- Promotes deep rooting, helps remove standing water
- Effective alternative to aggressive cultivation during extreme temperatures but use does not substitute for overall benefits of core aeration

Vertical mowing

- Knives that cut into the turf are attached to a rapidly spinning horizontal shaft.
- Depending on height adjustment, can be used to relieve grain, dethatch or cultivate.

Spiking

- Similar to a vertical mower, only blades are pointed rather than broad and flat. Blades are attached to a slowly turning horizontal shaft.
- Stimulates shoot and root growth

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Deep tine

- Tines penetrate the soil to a depth of 6-18 inches.
- If using hollow tines, holes can be back filled with a soil amendment to improve drainage
- Solid tines are beneficial when cultivating heavily compacted clay or gravelly soil
- Minimal disturbance to the surface with use of solid tines; core aeration results in significant surface disruption and a concentrated effort to manage the cores and/or topdress with new soil material
- Promotes deep rooting, helps remove standing water, aggressively fractures belowground compaction zones at 6-12 inch depths, increases initial water infiltration rate, creates deep aeration channels, and improves air, water, and nutrient movement through layered, poorly drain soils.

Photo courtesy of Elizabeth Guertal, Ph.D.

Deep drill/drill and fill

- Drills penetrate the soil to a depth of 6-18 inches
- Deep channels loosen soil

Seeding

Recommended months to apply seed or sod:

	March	April	May
Kentucky bluegrass	X	X	X
Perennial ryegrass	X	X	X
Tall Fescue	X	X	X

Recommended seeding rates (seed rates expressed in pounds of pure live seed):

Kentucky bluegrass	2-3 lb. / 1000 sq ft
Perennial ryegrass	4-6 lb. / 1000 sq ft
Tall Fescue	5-8 lb. / 1000 sq ft

Timing

It is important to seed throughout the year to maintain turf density. Depending on the severity of winter weather, fields may need to be overseeded to repair bare areas. High traffic areas may require higher seeding rates to increase the likelihood of growth and establishment and withstand spring sports wear. Seeding rates of 10-20 lbs / 1000 square feet can help in the rapid recovery of bare spots on fields. Seeding following core cultivation is an effective practice to encourage germination and growth. Always read the label when applying preemergence herbicides, as some can be detrimental to the growth of new seedlings.

Species and Mixtures

Always use certified (blue tag) seed when overseeding athletic fields. Certification ensures that the cultivar listed on the label is what is contained in the bag. The label also lists a test date. Seed should not be sold if the test date is more than 15 months past.

The species used for overseeding depends on the current species on the field and the amount of play the field will be receiving within six weeks of seeding.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Kentucky bluegrass

- Fine texture
- Resilient due to rhizomatous growth
- Traffic should not be allowed on the field until it is fully established due to slow germination and establishment rates.
- Once established, produces better wear tolerance and recovery.
- Drought tolerant
- If the field is made up of 100% Kentucky bluegrass, a blend of different cultivars should be used to maximize disease resistance and wear tolerance.
- Most fields are a mixture of Kentucky bluegrass (80-90%) and perennial ryegrass (10- 20%). The germination and recovery rate of perennial ryegrass aid in maintaining turf cover and density on these fields.

Perennial ryegrass

- Fine texture
- Quick establishment
- Good traffic and wear tolerance when combined with Kentucky bluegrass
- Poor cold tolerance
- Most fields are a mixture of Kentucky bluegrass (80-90%) and perennial ryegrass (10-20%). The germination and recovery rate of perennial ryegrass aid in maintaining turf cover and density on these fields.

Tall Fescue

- Fine to medium texture
- Good pest tolerance
- Most drought and heat tolerant of all the cool season grasses
- Poor tolerance to mowing heights less than 2 inches
- Good wear tolerance
- Good spring greening
- Poor cold tolerance
- Popular choice on low-input athletic fields as a monostand; when used on higher maintenance athletic fields, tall fescue should not be mixed with more than 10% of Kentucky bluegrass. Due to tall fescue's bunch type growth, Kentucky bluegrass is often added to help knit plants together and provide better recuperative potential.

Pest Control

Healthy, dense stands of turf are the best way to prevent disease, weed or insect infestations. Following proper cultural practices throughout the year, including fertilization, irrigation, mowing, seeding, and soil cultivation, can minimize and sometimes eliminate pest problems. The goal of turf management is to produce healthy turf while limiting reliance on pesticides. Many managers follow Integrated Pest Management (IPM) practices. This program does not completely eliminate pests, but maintains the population at a tolerable level. Pesticides are often a part of IPM programs, but they are selected and applied responsibly to avoid health risks to other living organisms than those targeted. It is important to routinely scout the fields and identify the pest problem in the early stages so a decision can be made whether its effects need to be controlled culturally or chemically. University research and efforts by turf managers and communities continue to evolve and support the trend towards sustainable turf management.

Make sure to check with your local and state agencies for any restrictions on applying pesticides. For areas with restrictions on inputs or other management program constraints or objectives, there are organic and microbial products available in the marketplace. STMA encourages you to talk with vendors and practitioners for recommendations to fit your specific needs.

Weeds

Recommended time to apply herbicides:

	March	April	May
Timing for control	X	X	X
Weeds most commonly controlled	Preemergence control of grassy weeds, Preemergence control of broadleaf weeds	Preemergence /postemergence control of grassy weeds, Preemergence /postemergence control of broadleaf weeds	Preemergence /postemergence control of grassy weeds, Preemergence /postemergence control of broadleaf weeds

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

The best defense against weeds is by increasing density and vigor of turfgrass to discourage weed competition. Weeds fill in voids in the turf. These voids can be avoided with proper selection and establishment of turf, adequate liming and fertilization per recommendations from soil tests, proper mowing heights and watering deeply and infrequently. If herbicides are necessary to control weeds, preemergence and postemergence products will control winter annual, summer annual, and perennial broadleaf weeds and grasses. Crabgrass is commonly controlled in the spring. If using preemergence control for crabgrass, forsythia and dogwood bloom provides an indicator for application timing. Spot treating weeds may be a desirable method of control as opposed to broadcast applications. Always read the label when applying preemergence herbicides, as some can be detrimental to the growth of new seedlings. If using postemergence herbicides, weeds should be actively growing for the most effective control. Never apply herbicides if the turf is stressed.

Crabgrass

Common Spring Weeds

Grassy weeds

- Crabgrass
- Goosegrass
- Foxtail
- Annual bluegrass

Broadleaf weeds

- Knotweed
- Black medic
- Common chickweed
- Mouse-ear chickweed
- Chicory
- Cinquefoil
- Curly dock
- Ground ivy
- Heal-all
- Henbit
- Buckhorn plantain
- Broadleaf plantain
- Purslane
- Red sorrel
- Creeping speedwell
- Annual speedwell
- Corn speedwell
- Spotted spurge
- Canada thistle
- Wild violet
- Wild carrot
- Yarrow
- Clover
- Dandelion
- Hawkweed
- Oxalis
- Pearlwort

Other weeds

- Yellow nutsedge
- Wild onion/garlic

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Insects

Timing of insect damage and the grass species affected:

	March	April	May
Kentucky bluegrass	Bronzed cutworms, Chinch bug adult, Sod webworm, White grub	Black turfgrass ataenius adult, Bluegrass billbug adult, Bronzed cutworms, Chinch bug adult, Sod webworm, White grub	Black turfgrass ataenius adult, Bluegrass billbug adult, Bronzed cutworm, Chinch bug adult, White grub
Perennial ryegrass	Bronzed cutworms, Chinch bug adult, Sod webworm, White grub	Black turfgrass ataenius adult, Bluegrass billbug adult, Bronzed cutworms, Chinch bug adult, Sod webworm, White grub	Black turfgrass ataenius adult, Bluegrass billbug adult, Bronzed cutworm, Chinch bug adult, White grub
Tall Fescue	White grub	White grub	White grub

Thin, weak turf is more susceptible to insect infestations. Insect damage can be minimized with proper selection and establishment of turf, adequate liming and fertilization per recommendations from soil tests, proper mowing heights, and watering deeply and infrequently.

Insect damage rarely occurs in the spring, but turf managers should always monitor for populations and treat accordingly. Many insects are in their adult stage during the spring. If fields have a history of insect damage, spring may be an optimal time for control of adult populations. Otherwise, insecticides may not be necessary.

Diseases

Timing of disease occurrence and grass species affected:

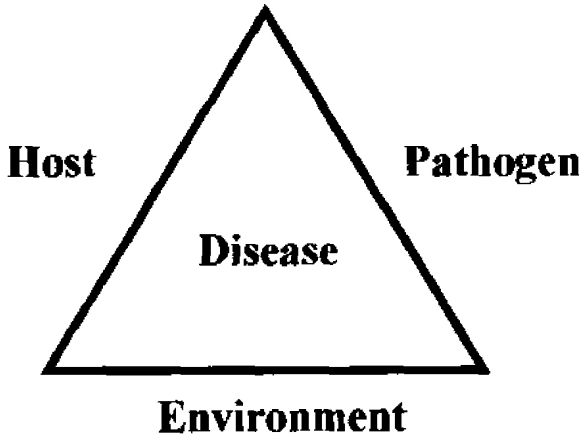
	March	April	May
Kentucky bluegrass	Gray snow mold, Pink snow mold, Yellow patch	Damping-off/seed rot, Dollar spot, Fairy ring, Gray snow mold, Leaf rust, Leaf Spot/ Melting out, Necrotic ring spot/summer patch, Pink snow mold, Powdery mildew, Yellow patch	Damping-off/seed rot, Dollar spot, Fairy ring, Leaf rust, Leaf Spot/ Melting out, Necrotic ring spot/summer patch, Pink snow mold, Powdery mildew, Red thread, Yellow patch
Perennial ryegrass	Gray snow mold, pink snow mold	Damping-off/seed rot, Dollar spot, Fairy ring, Gray snow mold, Leaf rust, Leaf Spot/ Melting out, Pink snow mold	Damping-off/seed rot, Dollar spot, Fairy ring, Leaf rust, Leaf Spot/ Melting out, Pink snow mold, Red thread
Tall Fescue	Gray snow mold, Pink snow mold, Yellow patch	Damping-off/seed rot, Dollar spot, Fairy ring, Gray snow mold, Leaf Spot/ Melting out, Pink snow mold, Yellow patch	Damping-off/seed rot, Dollar spot, Fairy ring, Leaf Spot/ Melting out, Pink snow mold, Red thread, Yellow patch

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Disease Triangle

Diseases occur when three factors are present and meet the correct conditions:

1) A susceptible host – The grass plants are the hosts; choose resistant and/or tolerant varieties whenever possible.
2) A virulent pathogen – The disease-inciting organism is almost always present in the soil and not causing problems. However, conditions sometimes change and it can attack the turf.
3) A suitable environment – When certain environmental conditions are present, disease may occur. For example, hot, humid weather often contributes to the appearance of some diseases.



Symptoms and Prevention

Dollar spot

- Symptoms – Spots appear small, circular, and sunken and can coalesce as disease progresses. Lesions on the leaves have an hourglass appearance with a bleached center with brown margins. In wet conditions, white, cottony mycelium can be present.
- Prevention – Maintain adequate nitrogen fertility. Water deeply and infrequently during morning hours. Promote air circulation.

Fairy ring

- Symptoms – Darker green or faster growing grass appears in a circular or arc shape. There can sometimes be a circular area of dead grass within or outside the ring of lush growth. Mushrooms can also develop.
- Prevention – Control is very difficult. Maintaining core cultivation, irrigation and fertilization can help suppress the disease.

Gray snow mold

- Symptoms – Circular areas of turf turn yellow or gray/brown. Wet leaves become matted together and are covered with gray or white mycelium. Dry leaves are gray and brittle with no mycelium. A defining characteristic is the small, hard, round sclerotia on infected leaves. They can be white, pink, brown or black. Gray snow mold requires snow for development.
- Prevention – Avoid heavy applications of quick release nitrogen in late fall. Avoid excessive thatch and prevent compaction. Keep turf height low to prevent leaves from matting. Promote air circulation in early spring by removing snow and ensuring proper drainage

Leaf rust

- Symptoms – Early infection appears as light yellow flecking of the leaves. As the disease progresses, reddish brown, powdery pustules appear.
- Prevention – Maintain balanced fertility and adequate irrigation. Mow regularly and minimize shade.

Leaf spot/melting out

- Symptoms – Small brown spots surrounded by a dark, purplish red border appear on the turf leaves. Spots enlarge until the entire width of the blade is blighted. When the crown becomes infected, entire tillers die and turf loses density.
- Prevention – Avoid excessive nitrogen in early spring. Use resistant turf cultivars. Water deeply and infrequently.

Necrotic ring spot / Summer patch (Necrotic ring spot and summer patch were previously combined as a disease complex know as 'fusarium blight')

- Symptoms – Circular patches of reddish brown or bronze leaves in response to a declining root system.. As disease progresses, leaves turn a light straw color. Usually begins as a ring and as turf dies, a depression forms in the center.
- Prevention – Disease is of particular concern on Kentucky bluegrass, so addition of ryegrass or fescues can lessen the damage. Irrigate during periods of drought stress and increase mowing height. Maintain balanced fertility. Monthly preventative fungicide applications from April through June are typical where there is a history of disease pressure.

Pink Snow Mold

- Symptoms – Circular areas of turf turn tan, light gray, or orange-brown. Fluffy mycelium may be present that appears pink in sunlight. Snow does not need to be present for development.
- Prevention – Avoid heavy applications of quick release nitrogen in late fall. Keep turf height low to prevent leaves from matting.

Pink Snow Mold

Powdery Mildew

- Symptoms – White or gray mycelium that appears powdery or dusty appears on the leaves and sheaths. Severe infection leads to yellow, tan, or brown leaves.
- Prevention – Reduce shade and ensure there is air circulation. Maintain balanced fertility program. Avoid drought stress.

Red Thread

- Symptoms – Circular or irregularly shaped patches of blighted grass have a reddish or pink color. The patch has a ragged appearance and leaves die from the tip downward. Pink, cottony mycelium is present in wet conditions.
- Prevention – Maintain fertility, but avoid excessive nitrogen. Water deeply and infrequently.

Yellow Patch

- Symptoms – Irregular patches or rings that are yellow in color. Individual leaves turn yellow and dieback from the leaf tip. Entire leaf is blighted. No mycelium is present.
- Prevention – Avoid high rates of nitrogen in the early spring. Use slow release fertilizers, control thatch, and make sure fields drain properly.

Chemical Control

Proper mowing, irrigation, fertilization, and cultivation can all lead to a healthy, dense field that is able to withstand moderate disease infestations. Unless fields have a history of poor disease tolerance, in order to abide by IPM standards, preventative fungicide applications are often not necessary. If the field is affected by a disease, a curative application should be sufficient.

Spring Athletic Field Maintenance Calendar for Cool Season Turfgrasses: March - May

Calendar

General overview of necessary maintenance practices performed during the spring on cool season turfgrasses:

	March	April	May
Mowing	X	X	X
Irrigation	X (weather dependent)	X	X
Fertilizer	X	X	X
Plant Growth Regulators		X	X
Cultivation	X (weather dependent)	X	X
Seeding	X	X	X
Weed Control	X	X	X
Insect Control	X	X	X
Disease Control	X	X	X