SportsTurf MANAGERS ASSOCIATION

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SAFE
The Foundation for Safer Athletic Fields

Spring Athletic Field Maintenance Calendar for Warm 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
Bermudagrass	1-2 in (should not exceed 2 inches)	1-2 in (should not exceed 2 inches)	1-2 in (should not exceed 2 inches)
Hybrid bermudagrass	¾-1.5 in (should not exceed 2 inches)	¾-1.5 in (should not exceed 2 inches)	¾-1.5 in (should not exceed 2 inches)
Fields overseeded with perennial, annual, or intermediate ryegrass	0.5-1.5 inches		

Frequency

Mow as often as needed so that no more than 1/3rd of the leaf blade is removed in a mowing event. Once bermudagrass begins to green up in the spring, mowing can take place twice a week. As temperatures and growth increase, bermudagrass fields may need to be mowed 2-3 times per week or as needed. Mowing early in the day to expose plants to light aids in spring green up. On overseeded fields, reduce the mowing height of ryegrasses 2 weeks before bermudagrass comes out of dormancy. This weakens the ryegrass and reduces competition with bermudagrass. After seasonal use on the overseeded turf is completed, use cultural (low mowing, increased fertilization, reduced irrigation, etc.) or selective chemical programs to remove the ryegrass from the bermudagrass.

Special considerations:

- Weather
  - o Rain – in the event of excessive rain, mowing should be avoided to prevent rutting and compaction.
  - o Extreme temperatures - avoid mowing in the middle of the day if temperatures exceed 90ºF as this may cause damage to the turf. High daytime temperatures rarely occur in March and April, but may become an issue in May.

1/3 Rule

A general rule when mowing any stand of turfgrass is not to remove 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

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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.

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Irrigation

Recommended amounts per week (minus any rainfall):

March	April	May
1-1.5 in/week (weather and growth 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. One or two irrigations per week are usually sufficient to maintain fields. Bermudagrass likely does not need 1-1.5 inches of water per week in March unless it is in a drought period.

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.

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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. If the weather is cool and rainy, spring irrigation will not be needed for bermudagrass. 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. Warm season turfgrasses utilize water efficiently and lose about .25 inches of water per day. (In comparison, cool season turfgrasses typically lose more than .4 inches of water per day to evapotranspiration.) 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.

Drought

Bermudagrass uses water efficiently and thrives in hot temperatures. Even in extended drought, bermudagrass only requires one to two irrigations per week.

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.

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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.

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 nutrients per month:

	March	April	May
Common and Hybrid Bermudagrass		0.5-1 lb soluble N / 1000 sq ft	1 lb soluble N / 1000 sq ft
Fields overseeded with perennial, annual, or intermediate ryegrass	Up to 0.5 lb soluble N / 1000 sq ft (if ryegrass requires feeding)	0.5-1 lb soluble N / 1000 sq ft	1 lb soluble 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

The first spring fertilizer application should be made 2-3 weeks after the bermudagrass begins to green up. Nutrient applications should always be based off of soil test recommendations, but early spring may be an ideal time to apply a complete fertilizer. In late spring, bermudagrass benefits from a high nitrogen source application.

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On fields overseeded with perennial, annual, or intermediate ryegrass, minimize early spring fertilizer applications in order to reduce the competition of ryegrasses with bermudagrass. However, if the turf is heavily trafficked, some nitrogen fertilizer can benefit turf quality and playability. When possible, wait for the bermudagrass to significantly green up before making a spring fertilizer application.

Photo courtesy of James Brosnan, Ph.D.

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.

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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.

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

Application of a plant growth regulator may be beneficial for conversion programs when transitioning from one type of grass to another. However, it may be costly and it must be timed appropriately. Spring growth of bermudagrass needs to be encouraged when it is competing with ryegrasses. Therefore, if PGRs are part of the maintenance program, application must occur prior to bermudagrass green up.

Cultivation

Recommended time for soil cultivation:

	March	April	May
Bermudagrass – Overseeded		X (dependent on weather and growth)	X
Bermudagrass – Not Overseeded		X (dependent on weather and growth)	X

Timing

Bermudagrass fields should only be cultivated when they are actively growing. Dethatching or core cultivation should take place on bermudagrass after spring greening is completed. For most fields, core cultivation should take place monthly and more frequent cultivation may be required on heavily trafficked and compacted areas.

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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.

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

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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, sprigs or sod:

	March	April	May
Common and hybrid bermudagrass	X (sod only)	X	X

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

Common bermudagrass seed	0.5-2 lb. / 1000 sq ft
Hybrid bermudagrass sprigs	400-800 bushels / acre is typical

Timing

May is typically the earliest month for successful seeding and sprigging of bermudagrass fields. It is also the best time to repair winter-killed or worn-out areas. Planting in mid to late spring will give the bermudagrass adequate time for establishment so the field can withstand traffic in the fall. If the field must be played upon within 8-10 weeks, sod will need to be installed. Sod can be installed essentially any time of year the soil is not frozen.

Species

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 or sprigging depends on the current species on the field.

Common bermudagrass

- Fine textured, dense, vigorously growing turf
- Disease resistant
- Performs well on a limited budget
- Can be seeded and has quick establishment
- Poor shade tolerance
- High wear, drought and salt tolerance

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- In warm, frost free climates, bermudagrass stays green all year. Optimum air temperatures for growth are between 75-100 degrees Fahrenheit. Optimum soil temperatures for growth are between 65-80 degrees Fahrenheit.
- Poor cold tolerance. Bermudagrass goes dormant after the first frost, or if temperatures are consistently below 50 degrees Fahrenheit.

Hybrid bermudagrass

- Fine textured, dense, vigorously growing turf
- Higher density and disease resistance than common bermudagrass.
- Hybrid bermudagrass is sterile and can only be sodded or sprigged. Both methods have quick establishment.
- Poor shade tolerance
- High wear, drought and salt tolerance
- In warm, frost free climates, bermudagrass stays green all year. Optimum air temperatures for growth are between 75-100 degrees Fahrenheit. Optimum soil temperatures for growth are between 65-80 degrees Fahrenheit.
- Poor cold tolerance. Bermudagrass goes dormant after the first frost, or if temperatures are consistently below 50 degrees Fahrenheit.

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	Postemergence control of winter annual and perennial weeds, Preemergence control of crabgrass and goosegrass, Preemergence control of summer annual broadleaf weeds, Postemergence control of ryegrasses (if fields are overseeded)	Preemergence /postemergence control of crabgrass and goosegrass, Preemergence /postemergence control of grasses, sedges, and broadleaf weeds, Postemergence control of ryegrasses (if fields are overseeded)	Postemergence control of crabgrass and goosegrass, Postemergence control of grasses, sedges, and broadleaf weeds

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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.

While bermudagrass is dormant during the winter, annual bluegrass and winter annual and perennial broadleaf weeds can invade and outcompete bermudagrass the following spring for sunlight. This can delay green up. Applying a broad spectrum, non-selective herbicide is a common method for controlling weeds in dormant bermudagrass. **Remember, bermudagrass must be completely dormant when making this application.**

On overseeded bermudagrass fields, perennial, annual, and intermediate ryegrasses provide green, actively growing, uniform playing surfaces during the winter and early spring. However, if the spring is cool and wet, ryegrasses may survive longer than desired. This can result in competition with bermudagrass, an inconsistent playing surface, and overall poor quality bermudagrass field. Ideally, ryegrass should be transitioned out of a bermudagrass stand by late spring or early summer. The most effective means of removing ryegrass is through chemical removal.

Crabgrass

Common Spring Weeds

Grassy weeds

- Tall Fescue
- Annual bluegrass
- Perennial, annual, and intermediate ryegrasses
- Crabgrass
- Goosegrass
- Bahiagrass
- Dallisgrass
- Sandbur
- Foxtail

Broadleaf weeds

- Prostrate knotweed
- Dandelion
- Spotted spurge
- Common lespedeza
- Broadleaf plantain
- Buckhorn plantain
- White clover
- Virginia buttonweed

Other weeds

- Yellow nutsedge
- Annual sedge
- Green kyllinga
- Purple nutsedge

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Insects

Timing of insect damage and the grass species affected:

	March	April	May
Common and Hybrid Bermudagrass			White grub, Sod webworm, Cutworms, Armyworm, Billbugs

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

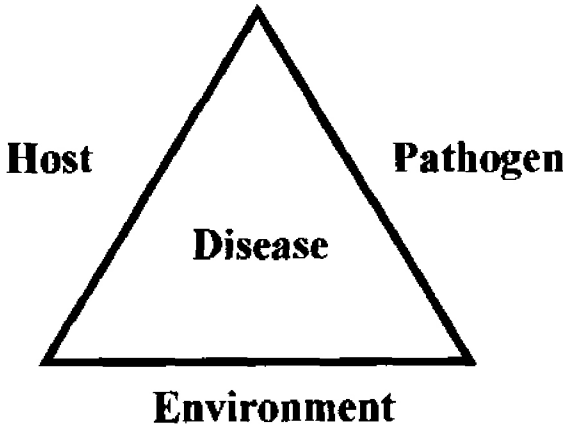
Timing of disease occurrence:

	March	April	May
Common and Hybrid Bermudagrass	Fairy ring, Spring dead spot -(treat in fall)	Large patch, Dollar spot, Fairy ring, Spring dead spot -(treat in fall)	Large patch, Dollar spot, Fairy ring, Leaf spot/ melting out

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

Large patch

- Symptoms – Leaves have a dark margin with light brown in the center. Forms a circular patch that is surrounded by a dark purplish ring (known as a smoke ring) that is visible in the morning. Grey to white mycelium can be seen on affected areas. Occurs on cool-season grasses typically in the warmer months of the year and on bermudagrass during spring or fall.
- Prevention – Maintain adequate fertility and drainage. Remove dew in the morning and minimize thatch.

Large Patch - Photo courtesy of Dr. Noel Jackson

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.

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.

Spring dead spot

- Symptoms – Circular, completely dead patches of bermudagrass that are evident as the grass emerges from winter dormancy; soil-borne fungus attacks root systems and crowns during the fall and grass typically dies due to winter stress under its weakened condition
- Prevention – Sequential applications of appropriate fungicides in late summer to early fall can greatly reduce SDS pressure over 2-3 seasons; raise mowing heights in the fall, ensure appropriate pH and nutrient needs, reduce late-season N applications.

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 Warm Season Turfgrasses: March - May

Calendar

General overview of necessary maintenance practices performed during the spring on warm season turfgrasses (both overseeded and non-overseeded):

	March	April	May
Mowing	X	X	X
Irrigation	X (weather and growth dependent)	X	X
Fertilizer	X (dependent on if ryegrass needs feeding)	X	X
Plant Growth Regulators			
Cultivation		X (dependent on weather and growth)	X
Seeding	X (sod only)	X	X
Weed Control	X	X	X
Insect Control			X
Disease Control	X	X	X