

Growth Characteristics and Identification of Desert Turfgrass

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Warm Season Grasses

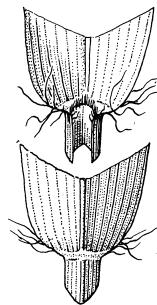
Bermudagrass lawns are actively growing from mid-April to mid-October. They are termed "warm season" grasses because of this. In general, there are two categories of bermudagrass, common, and hybrid bermudagrass.

Common bermuda has leaf blades, which are 1/8" (3mm) wide, and attach themselves to the grass shoot at intervals of about 1/4 inch (6mm). This leaf width and leaf arrangement gives common bermuda a "medium" texture appearance. Common bermudagrass is best mowed between 3/4 inch to 1 1/2 inch with a reel type mower. Common bermudagrass can be mowed between 1 1/2 to 2 " with a rotary mower. Common bermudagrass is easily established from seed.

'Hybrid' bermudagrass is the result of mating common bermudagrass with African bermudagrass. The result is a plant which has fine leaf texture and does not produce pollen or seed. Hybrid bermudagrasses have narrower leaf blades (1/16") (2mm or less) and are attached very closely to each other on the main shoot. They also have more individual shoots per square inch of turf than common bermudagrass. Because of this dense growth habit, 'hybrid' bermudagrasses tolerate and require shorter mowing heights. Tifgreen (Tif 328) can be mowed as low as 5/32" or less with special maintenance practices. There are several varieties of bermudagrass used for golf course greens that can be mowed at 1/8" or less. These are referred to as "ultra-dwarf" bermudagrass varieties.

Most other hybrid bermudagrass varieties can be mowed at 1/2 " with a reel-type mower. Higher mowing heights of 1 1/2 to 2" with a rotary mower can result in puffy turf, which is subject to scalping. 'Hybrid' bermudagrasses are established from vegetative plant parts, and not from seed. It is commonly established through sodding, stolonizing, and to a lesser extent, plugging. Newly developed seeded bermudagrasses are becoming increasingly available on the commercial market. Since they produce seed, they must produce pollen. Newly released seeded bermudagrasses which are being sold as improved turf types includes the following cultivars. Numex Sahara, Cheyenne, Sonesta, Sun Devil and Guymon, Palo Verde, Princess and Sultan.

*Note: hairs on collar region where leaf meets shoot.
Note: midvein appears as a slight fold in the middle of the leaf.*



Buffalograss has leaves that are narrow in width and dull light green in color. The leaves have erect leaf hairs with no auricle. The ligule is made up of short tufts of hairs in the middle with long hairs towards the edge of the ligule. Emerging leaves are rolled in the shoot and short above ground stolons are produced.

Buffalograss is a true prairie grass with good heat and drought tolerance. It is established by vegetative plant parts or by seed which is collected from female plants. Buffalograss is fine in texture and forms a dense turf. Its light green color is objectionable to some. Buffalograss is not tolerant of sand or salty soils, and will not withstand



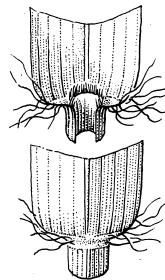
note :hairy leaves of buffalograss on both sides

shaded conditions. Its ability to withstand traffic and wear is less than that of bermudagrass. Buffalograss lawns can be established in one growing season if ample water is applied for germination and initial growth. Buffalograss can be used for low maintenance turfs at 2500 to 7000 ft elevation. It is truly an energy efficient grass. It can survive with minimal nitrogen (0.5 to .75 pounds of N). Its water requirements are close to that of bermuda.

Buffalograss can withstand close mowing (1.5 inches) if supplementary irrigation is provided, but a low maintenance lawn can be cut once a month during the summer at 2.5 to 3.0 inches. Buffalograss, like zoysia and bermudagrass will loose color during the cool and cold seasons. It does not tolerate overseeding well. Buffalograss is excellent for individuals who enjoy "minimal maintenance" of their lawn.

Zoysia is a warm season grass which has limited use in Arizona. Most Zoysia cultivars suffer from our high pH soil conditions and show iron chlorosis. Zoysia is unique in that it would grow in Yuma, and at elevations up to 7000 feet or so. At higher elevations, Zoysia would be a dormant straw colored turf from October to mid-May. Zoysia is used on golf courses in the Kansas City area where bermudagrass suffers from the cold and Kentucky bluegrass suffers from the heat. Low growing cultivars are available, and they have been used to a limited extent on golf courses as surround strips around bentgrass greens to prevent Bermuda encroachment. Zoysia leaves and stems are tough and stiff which gives zoysia excellent wear tolerance when it is growing well during the hot summer season. Once injured, it is slower to recuperate than bermudagrass turfs.

Note: long hairs were leaf blade meets the stem on zoysia.



Zoysia leaves have no distinct features in vein patterns or mid vein presence. They appear sometimes as "random folds" across the leaf surface. Zoysiagrass leaves are flat, end in a long point and are bright, dull green in color. There is none to sparse hairs on the leaf surface with emerging leaves rolled in the stem. Zoysia does have sharp and thick rhizomes. The rhizomes are "attached" to upright stolons which have their leaves at right angles to the stems. This is a relatively unique feature. The junction of the leaf blade and the leaf sheath (shoot) on Zoysia shows long hairs. There are a few sparse hairs on the top of the leaf, which can be seen when the leaf is tipped and turned over.

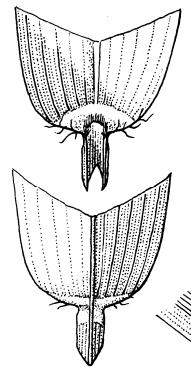
The most common zoysia is a low maintenance turfgrass whose leaf texture and quality is variable like the bermudagrasses. It too forms rhizomes and solons. Common zoysiagrass is established by vegetative parts and by seeds. Zoysia is heat and drought tolerant, requiring little water during the summer. It is more shade tolerant than bermudagrass but only in areas where it is warm year round. Zoysia is used for low maintenance lawns and where its slow establishment is not important. On home lawns common zoysia is usually cut between 3/4" to 1 1/4" with a reel-type mower. It can be cut higher at 1 3/4" to 2.0" with a rotary mower. Zoysia needs less frequent cuttings than bermudagrass. Zoysia requires a sharp reel mower at low cuts. At higher cuts, thatch usually develops. Like bermudagrass, zoysia is only actively growing during warm summer periods and remains off color (tan) during fall,

winter, and spring.

St. Augustinegrass is a warm season turfgrass. Like Zoysiagrass, it suffers from iron chlorosis from our high soil pH. St. Augustinegrass is fairly shade tolerant and grows in full sun as well. Its wide leafs and fluffy stolons do not make it a candidate for sports turf use. It would grow in Arizona in the low elevation deserts and would be marginal for winter survival in areas such as Safford and Prescott. It can be mowed at base heights of 1-1/2 to 3 inches. Arizona sod growers may offer one or two varieties, depending on demand. It is sometimes used for home lawns only, and never as a sports turf.

The leaf of St. Augustinegrass is wide. The mid-vein is easily seen. The leaf tip is not pointed, but club shaped. Sometimes the “club” will have a split in the margin. The stolons usually sport “left” and “right” plants on each side of the stolon shaft. The individual stems are very flat and cannot be rolled over with the fingers. The leaf veins are generally not visible, unless the plant is suffering from lack of iron, nitrogen, or both.

*Note: St.Augustine has easily seen midvein.
The leaf tip is club shaped.*



Seashore paspalum is a warm season grass. It originates from areas in the world which receive tidal floodwaters or mixed estuary water. It is salt tolerant. Like bermudagrass, it has both rhizomes and stolons. Like Bermuda, it has a midvein down the middle, being somewhat more pronounced than bermudagrass. Like Bermudagrass, it has a pointed leaf tip. Like bermudagrass, it has a hairy ligule (union of leaf blade and stem). So, how does it differ from Bermuda? The stolons when growing over open ground, are visibly segmented like a centipede. The spaces between the leaves on the “open ground” stolons are purple in color at first. Paspalum also has a very waxy/shiny appearance to the leaves. Bermudagrass is more “dry to the touch” than paspalum. The color of paspalum is usually somewhat lighter in color than bermudagrass. This is not always the case. The centipede like stolons and the waxy feel differentiate Bermuda from paspalum. Paspalum has seen limited use in Arizona since the release of two commercially available cultivars. They are Sea Isle 2000, and Sea Isle 1. Neither likes to be mowed with a rotary mower. Rather, they do much better with a reel mower at heights of 3/8 to 1.0 inch. Sea Isle 2000 is mowed on green at 1/8”. When mowed above 3/8”, Seashore paspalum has trouble when overseeded with ryegrass in the fall.

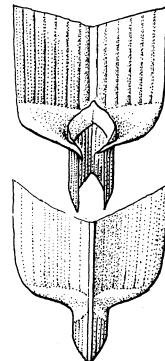
The disturbance of the stolons during summer thatch control (vertical mowing) and canopy thinning at overseeding (again, vertical mowing) shock paspalum way more than these operations do on bermudagrass. Paspalum is also slow to grow back from mower scalping of any kind. Paspalum is adapted to the low growing desert valleys. It survives at a high height of cut in Albuquerque New Mexico, when not overseeded.

Cool Season Grasses

During the fall, bermudagrasses can be overseeded with ryegrass. Either annual or perennial ryegrasses can be used. These grasses germinate quickly and have excellent seedling vigor, thus establishing turfs easily.

Perennial ryegrasses normally do not last all year at elevations below 4000 feet and therefore are not truly "perennials" in the central and Southern deserts of Arizona. Perennial ryegrasses are better adapted to closer mowing conditions than annual ryegrass, since they have many narrow leaves on each individual shoot. They also have more shoots per square inch of turf than annual ryegrass once they are mowed 2-3 times.

Perennial ryegrass can be identified by recognizing some prominent features. The underside of the leaves is very shiny and smooth. The leaves have a series of ribs on the surface which cover the entire leaf surface. In the middle of the leaf is a visual depression which forms the mid-rib.

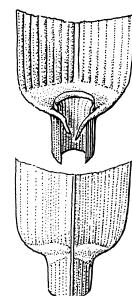


Note: very shiny leaf undersides.

Note: midvein is easier to see than the side veins.

Perennial ryegrass can be mowed as low as 1/8" or less with special management. Moreover, it is adapted to mowing heights of 3/8" to 3/4" with a reel type mower. It also is suitable for mowing heights of 1 1/2 to 2 1/2" using a rotary mower, which is common in the landscape industry.

Annual ryegrass is lighter in color than perennial ryegrass. It also has a wider leaf blade, and the mid-vein is not as distinct as that of perennial ryegrass. An enlarged appendage can be found on annual ryegrass where the leaf attaches to the grass shoot. It resembles large collars on a dress shirt and is called an auricle. These auricles wrap around the shoot and are termed "clasping auricles." These are easily noticed on annual ryegrass but much less so on perennial ryegrass.



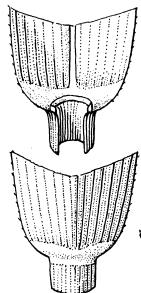
Note: less noticeable or absent midvein .

*large "clasping" auricles which look like "arms" on the leaf edge
that "wrap" around the stem.*

Annual ryegrass does not tolerate frequent close mowings. It is best adapted to mowing heights of 1 1/2" to 3.0 inches using a rotary type mower. It is used by landscapers to overseed bermudagrass on commercial properties and home lawns. It has been replaced by perennial ryegrass in most cases for overseeding bermudagrass.

Tall fescue is a cool season grass which has improved turfgrass qualities. It is more heat tolerant than the ryegrasses. Its normal range of adaptation does not include the desert areas of Arizona.. Tall fescue requires 8-12 inches of true soil for proper root growth. It does have fair shade tolerance and has been used to some success in heavily shaded areas, replacing St. Augustine grass. Tall fescue is more easily grown in areas of 4000 to 7000 feet in elevation.

Tall fescue has leaves which are about as wide as annual ryegrass, both of which are wider than those of perennial ryegrass. The vein pattern is different from the ryegrasses as well. Tall fescue has a flat leaf with many large veins clearly visible on the leaf surface. It does not have a mid-rib like perennial ryegrass. Tall fescue is easily established from seed in the middle of September in Tucson, and by the first week of October in Phoenix. The underlying bermuda or St. Augustine and/or bermudagrass must be eliminated first, by spraying the actively growing warm season grass with round-up herbicide in the summer. Tall fescue is sometimes mixed with Kentucky bluegrass as a low maintenance sports turf at elevations of 4500 feet and higher.



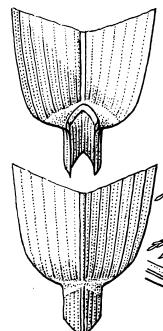
*Note: veins are wide and easy to see.
There is no true mid-vein present. Underside of leaf has a "backbone" or false midvein.*

These three cool season grasses (perennial ryegrass, annual ryegrass, and tall fescue) grow by producing individual shoots in bunches (tillers) from the base of each plant. For this reason, they are called "bunch grasses." Therefore, it is important to have uniform seed distribution when seeding cool season grasses to avoid a bumpy turf. In contrast, bermudagrasses produce long above-ground shoots called "stolons," as well as underground shoots called "rhizomes." This is the main reason why bermudagrasses fill in so quickly.

Kentucky bluegrass has leaves that are folded in a "V" shape with boat shaped leaf tips. Two very small close veins form the midvein. KBG has rhizomes and the newest leaves are folded within the shoot.

Kentucky bluegrass is used at elevations of 4500 feet and above when irrigated. It is used on home lawns, golf fairways and most parks. It has good winter survival and moderate heat and drought tolerance. It requires moderate to high level of care requiring adequate irrigation and anywhere between 2.0 to 4.0 or more pounds of nitrogen per year. It grows best when mowed at heights between 2.5 to 3.0 inches. Kentucky bluegrass can establish itself after stress periods, since new plants develop from underground stems (rhizomes). Kentucky bluegrass is best adapted to sunny conditions, but a few varieties are quite shade tolerant. There are over 90 varieties of Kentucky bluegrass for turf. To avoid planting an inferior variety, check with your extension office for the ones best adapted to your area.

*Note: KBG has just a midvein, without side veins.
The "boat shaped" leaf tip is unique to KBG.*

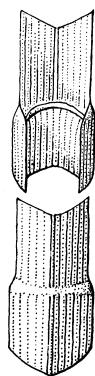


Fine fescue is a “catch-all” for several fine fescue species of turf. In Arizona, we use creeping red fescue in seed mixtures with Kentucky bluegrass and perennial ryegrass. Fine fescues are cool season grasses. Creeping red fescue is fairly shade tolerant, and that’s why it’s included in the “shot gun” approach mentioned above. The leaves of creeping red fescue are needle-like in appearance, and somewhat rigid to the touch. It is somewhat slow to establish. Certain types of Fine fescues can be used as feature plants in landscapes, were they grow unmowed either as an entire sword or as a bunch or clump plant. The sheep fescues and blue fescues are used for the above, although they will take mowing at 2.0 inches or higher.

The leaves actually have ridges of leaf veins on them, but you have to flatten out the leaves with your fingers to see them. If you do, you will also see that there is no mid-vein. Creeping red fescue may be grown on golf course roughs when mixed with KBG or ryegrass at elevations pf 6500 feet and above in Arizona.

Chewings fescue and creeping red fescue have been “toyed” with as overseed components with perennial ryegrass planted on bermudagrass greens.

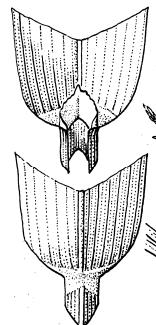
Note: needle-like leaves offine fescue.



Poa trivialis is also known as roughstalk bluegrass, and is related to Kentucky bluegrass and the weedy annual bluegrass. It is found naturally in cool low lying wetlands. It is used almost exclusively to overseed bermudagrass greens in the fall. It can be mowed very low (1/8" or less). It has a lime light-green color. The plants produce very short stolons which can make a fluffy surface if not cultivated correctly. The leaf tip is shaped like a speed river canoe. It has a sharp boat shaped tip. The leaf tip is not flat. It has a midvein down the middle of the leaf, without the presence of other veins present. The papery chimney like growth (ligule) at the union of the leaf blade and shoot is short and truncate. It looks like a wax paper collar of a priest’s garb. This is an important feature when sampling grasses on low cut greens.

Note: semi-canoe shaped leaf tip.

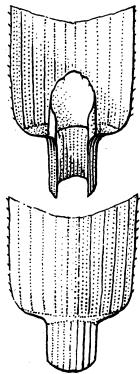
Note: midvein only, side veins absent.



Bentgrass is another cool season turfgrass. There are several bentgrass species in turf. We are concerned with creeping

bentgrass, which is used on golf course greens. As a cool season grass, it stays green year round unless it dies in the summer, or goes to sleep in the winter from prolonged cold temperatures. It is the “cadillac” of greens. It struggles from late May to September at elevations of 1500 to 2000 feet in elevation. It struggles from July to September at elevations of 2400 to 3000 feet in elevation. Bentgrass leaves have readily apparent veins across the leaf surface. It does not have a midvein. It has a moderately light green color and looks like *Poa trivialis* on a green. The ligule (paper sheath) at the union of the leaf blade and stem is tall and is jagged on its edge, unlike *Poa trivialis* which has a short and smooth ligule, and just the midvein is present.

Note: tall papery ligule and veins.
Few coarse veins across leaf.
No mid-vein present.



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