



# Characteristics of the Hot Climate Grasses

## THE BERMUDAS

Bermudagrass is thought to be native to Africa, but has spread worldwide where there is adequate rainfall to sustain them and winters are not so severe they are killed out.

All Bermudas thrive in hot weather. They grow rapidly and perform poorly under shade. Common Bermuda produces rather open type turf subject to weed invasion, diseases readily in most locations, and produce an abundance of unsightly seed heads. Improved seeded Bermudas that are superior to Common are being released, but none match the density and fine leaf texture of the hybrids.

The hybrid Bermudas produce denser turf less subject to weed invasion, fewer seed heads, and have good disease resistance.

All Bermudas spread so rapidly that they are difficult to control in beds, walks and borders, and if adequately fertilized require very frequent mowing. In spite of the apparent disadvantages outlined above, Bermudas are the best answer where good turf is absolutely essential, such as on golf courses and athletic fields.

Because of the ease and economy of establishment, seeded common Bermudas are frequently used on home lawns in spite of the extremely high maintenance costs. In recent years many hybrid Bermudas have been bred, selected and marketed and practically all of them are much superior to the seeded Bermudas (better color, better texture, greater density, fewer seed heads and less disease) and one of the hybrid Bermudas should be selected where the use of Bermuda is advisable.

Since the few seed they produce either will not grow or will not bring back a true strain of the superior plant, the hybrids must be vegetatively propagated (sprigged, plugged or sodded). The best known and widely available hybrid Bermudas are:

### Tifgreen Bermuda (T-328)

This fine textured, medium green Bermuda was released by Dr. Glenn Burton at the Coastal Plain Experiment Station in Tifton, Georgia in 1956. Dr. Burton bred and released both pasture and turf-type Bermudas in his 60 year career and the grasses he developed are known and used throughout the world.

Tifgreen was his first big-time winner from the thousands of turf-type hybrids bred by him prior to 1956. It revolutionized the standard of golf course Bermuda putting greens around the world and is still an outstanding Bermuda. A quick rooter and rapid spreader, Tifgreen is slightly inferior to Tifway for general turf usage.



### Tifway Bermuda (T-419)

Released by Dr. Burton in 1960, Tifway was an instant winner. Darker green and slightly coarser than T-328, it produces an extremely dense turf and, once established, maintains a dense, attractive turf with somewhat less fertilizer than any other Bermuda. It is a slow rooter, but spreads fairly rapidly.

### Tifdwarf, TifEagle® Bermudas

The dwarf Bermudas, beginning with Tifdwarf have been selected and bred for their extremely fine leaf texture, dark green color and ability to tolerate the very close mowing required on golf greens. None of these dwarfs or so-called super dwarfs are recommended for home lawns because of their very high maintenance requirements.

### Shanghai®, TifSport® and other Bermudas

A selection discovered by Dr. Burton in Shanghai, China in 1974. It is blue-green in color and while coarser textured than Tifway, it has better cold tolerance and a lower fertility requirement to maintain good color.

TifSport Bermuda was bred and released by Dr. Burton's successor, Dr. Wayne Hanna and is a rising star among the Tifton Bermudas. It is being ranked better than Tifway, in most categories including better cold tolerance.

Other Hybrid Bermudas are recommended and available in some areas. Some, such as Valmont and Midiron are more cold tolerant, but very coarse and not too attractive. Some seeded varieties, such as Cheyenne and Sahara, are superior to common seeded Bermudas. Beware of spectacular claims--Tifway has been around 30 years and continues to rate at the top of countless research tests worldwide.

## THE ZOYSIAS

A family of grasses native to many parts of the Orient, Zoysias were first introduced to the United States in the early 1900's.

In description, any of several strains of Zoysia sound like excellent all-around lawn grasses. They grow slowly and close to the ground, thrive on a wide range of soils, have good shade tolerance, and produce such dense turf that weed invasion is resisted.

In past years Meyer and Emerald and some strains of Matrella have been the most widely known and available Zoysias used in this country. They must be propagated vegetatively and rooting and growth is slow. Solid sodding is recommended, as is an underground irrigation system.

Zoysias grow slowly and require infrequent mowing, but they are so dense that a good sharp mower with adequate power should be used and cutting should be on a regular schedule. If "scalped" in mowing and subjected to other unfavorable treatment, Zoysias are slow to recover.

### Meyer Zoysia

A natural hybrid selected and released by Dr. Ian Forbes and associates at the Department of Agriculture's Beltsville, Md., Experiment Station, Meyer (Z-52) Zoysia was the first really superior Zoysia grass.

Medium in texture, it has good color, good disease resistance, excellent cold tolerance and as Zoysias go, is fairly readily established from sprigging.

Meyer seems to be preferred by mole crickets, a non fatal nuisance, and by the bill bug, a hard to kill soil insect that can be fatal.

Meyer is easier to mow than Emerald, but makes more upright growth and requires somewhat more frequent mowing. It performs best in the upper parts of Zone 2 and in Zone 3. It is the only hot climate grass recommended for Zone 4.

### Emerald Zoysia

Emerald Zoysia is the Cadillac of lawn grasses. An artificially bred hybrid

released by Dr. Forbes several years after Meyer, Emerald produces an extremely dense, fine textured turf of true emerald green color.

It simply cannot be neglected for long periods of time, but if fertilized once or twice annually, watered as needed and cut regularly, it makes a lawn in sun and/or moderate shade that is the envy of any neighborhood.

Emerald is very cold hardy, and although all the hot climate grasses turn brown after killing frosts, small plots of Emerald will maintain green color throughout most winters as far north as Atlanta in commercial areas where it is well protected and benefits from radiation heating from buildings and asphalt paving. It is especially useful where outstanding appearance is worth a premium, such as patios, around pool decks and small turf islands in shopping centers, apartments, etc.

Well adapted to Zones 1, 2 and 3. Less troubled by insect pests than Meyer, it is highly recommended for solid sodding where the owner will cut it regularly (not as frequently as Bermudas) with good mowing equipment.

### Zenith® Zoysia

Zenith Zoysia is the result of over 50 years of research searching for a Zoysia with good texture and turf quality that could be propagated from seed. Zenith is in the Japonica family as is Meyer and is similar to Meyer in texture and color.

Planted shallow on a newly prepared seedbed and watered frequently, Zenith germinates readily producing a stand of seedlings in 10 to 14 days. Like all Zoysias, it grows and spreads slowly and therefore seeding rates of one to three pounds per thousand square feet are recommended. Like Meyer Zenith® will grow in zones 2, 3 and 4.

### Centipede

Centipede was introduced by seed from China in 1919. Medium in texture with a pale to medium green color, Centipede is a slow growing but highly aggressive grass that can be depended upon to produce a good, dense, relatively weed free turf at low maintenance levels.

In spite of its aggressiveness, Centipede is easily controlled and usually requires edging only once a year around walks and flower beds.

Although Centipede usually produces a good turf on low fertility and with little management, it responds nicely to good care. It is incapable of producing a high quality turf as the Bermudas and Zoysias, but it frequently looks better than either because the "high brow" grasses are not getting the more exacting care they need.

Chinese red-stem (P. 1.72,260) is the strain extensively used in this country and while new varieties have been introduced, currently none show any superiority to the original strain. Where crabgrass competition is not too severe, Centipede is easily established with seed or sprigs in one growing season. Regular watering is the key to rapid establishment.

Some of Centipede's most desirable features are not readily apparent. It is one of the few lawn grasses which does not look scalped when cutting is delayed too long and excessive growth removed, an important feature because most homeowners postpone mowing too long at times.

Centipede is probably the easiest of all the grasses to cut, and any type mower, if sharp does an easy and attractive cutting job. A good rain or a good soaking enables Centipede to green up rapidly after a brief drought, but because of this asset owners often allow it to suffer severely during droughts. Don't.

Centipede is not suited to alkaline soils (high pH), should not be limed, and should be fertilized very sparingly. It has plenty of disease and insect enemies, but is generally more trouble-free than other grasses if watered properly and fertilized sparingly or not at all. Zones 1 and 2.

### Saint Augustine

A native seashore plant, St. Augustine has been popular along the lower Atlantic and the Gulf Coasts for several decades. It has broad blades and large, coarse stems, but produces a fairly compact sod subject to slight weed invasion.

The most redeeming features of St. Augustine are its attractive color and vigorous year round growth in frost-free climates. It is a rapid grower requiring frequent mowing, but is easy to mow.

St. Augustine is the most shade tolerant of all permanent hot climate grasses and performs well in wet soils and under salt spray. Basically a tropical plant, St. Augustine is ill-adapted as far north as Atlanta and will usually be killed by cold in the middle South.

It is highly susceptible to serious or fatal damage by chinch bugs. Good commercial spray applications and fertilizers containing the proper insecticides can control chinch bugs, but the bother and expense of continued control and preventive measures make the desirability of St. Augustine questionable where another grass will do as well or better.

Few seeds are commercially available and St. Augustine must be propagated vegetatively. Sprigs are easily established and grow off readily, and St. Augustine sod is inexpensive.

### Mercedes® and Raleigh

Mercedes and Raleigh are the most cold tolerant of the readily available St. Augustines, and each has satisfactory shade tolerance. Neither is resistant to chinch bugs. Floratam has poor shade and cold tolerance, but is widely used in Florida. New strains demand caution north of the Florida line.

## Establishing a New Lawn

Like a good house, a good lawn needs a good foundation. If your lot was stripped of topsoil in preparation for building, any grass will perform better if you will replace several inches of topsoil from a wooded area. Bulk topsoil from other sources can be infested with crabgrass and other weed seeds. Blending the topsoil with the subsoil is vital-growing in a layered condition is often more troublesome than growing in the subsoil.

### Preparing the Seedbed

Grade and level the lot, removing all sticks, stones, and pulverizing all large clumps of earth. Be sure that drainage is away from all buildings and that grades are established as you desire them because once your grass is planted any change will be difficult and expensive.

During pre-planting preparation mix into the soil 10 to 20 lbs. per 1000 square feet of a complete fertilizer such as 5-10-10 or 10-10-10, and approximately 50 lbs. of ground limestone per 1,000 square feet. For Centipede use only half as much complete fertilizer and no limestone.

Your grass will perform better if the fertilizer and lime is tilled six or eight inches deep into the soil than if left on top. Don't skimp on good seedbed preparation.

### Solid Sodding

While building costs have gone up, sod prices have come down. In most areas sod can be bought and laid like a rug, thus producing an instant lawn, for prices ranging from 20 cents to 30 cents per square foot, depending upon

the sod variety and local market.

Typically the sod is harvested in blocks 16" wide and 24" long or in strips 16" wide and 81" long which are rolled for easier handling. The thickness runs 1" to 1-1/2", of which about 1/2" is soil and the remainder is grass, so that for solid sodding the grades around sidewalks and drives should be approximately 1/2" lower than the paving.

Laying solid sod is fairly simple. Schedule delivery only after you have prepared a seedbed and are ready to lay, and then insist on prompt delivery after harvest. Start laying along the longest edge-curb, driveway or building. Stagger blocks or strips as if laying bricks. Butt sod firmly and stretch each piece so that the roots will lay flat against the soil. In dry, hot weather, lightly wet the surface before laying, and water each small area well immediately (within one hour) after laying.

Water at least once each afternoon until the sod is firmly rooted.

When lawns with steep slopes are seeded, it is a good idea to lay strips of solid sod every six to ten feet across the slope to assist in erosion control. "Nail" the sod to the ground by using long, homemade wooden spikes.

### Sprigging and Plugging

All hot climate grasses may be planted vegetatively by sprigging or plugging, slow and laborious procedures.

Sprigs are individual of a grass plant with some root or rhizome and some leaf, and may be acquired from a neighbor's lawn of torn from sod. Plugs are small pieces of sod grown in trays or chopped from sod with an ax or machete.

As a rough rule of thumb, one square foot of sod will produce enough sprigs to plant 200 or 300 sq. ft. or enough 2" x 2" plugs to plant from 20 to 40 sq. ft., depending upon spacing. The survival rate on plugging is usually somewhat better than on sprigging, but plugging is more trouble and the difference in coverage time is negligible.

### Seeding

Centipede and Zenith® Zoysia are the only better lawn grasses for which seed are commercially available. The per pound price of the seed is high but four ounces per 1,000 square feet for Centipede and 1 pound per 1,000 Square feet for Zenith® is adequate and the cost of seeding is less than establishing any of the better grasses vegetatively, and only a few dollars more for the average lawn than the cost of using grass seed mixtures or Bermuda seed. Centipede and Zenith® Zoysia seeded lawns start slowly, but usually produce coverage quicker than plugs.

Best results are obtained when Centi-Seed® and Zenith® Zoysia are planted in very early spring, but they may be sowed throughout the spring and summer and until about 60 days before frost.

Broadcast Centi-Seed® and Zenith® Zoysia on a well prepared seedbed with a Cyclone type spreader. Use a narrow flow-gate opening, apply half the seed traveling east to west and the other half traveling north to south to insure uniform distribution. Rake lightly but thoroughly to mix the seed into the top half inch of soil. Water well and keep the surface moist.

If you use Bahai, Carpet or seeded Bermudas, seed in the same manner except use two to four pounds of seed per 1,000 square feet.

Water seeded areas frequently enough to keep the surface moist until the tiny seedlings have a well established root system. Hasten coverage by topdressing with a nitrogen fertilizer, beginning when the seedlings have about four leaves. Be certain to water well to avoid chemical burn.

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## Converting Old Lawns

Owners with unsightly lawns in which the grass is thin and the weeds thick have three courses of action. The easiest is to play along with what is there. Fertilization, regular watering and regular mowing will improve the appearance of almost any poor lawn.

The surest method is to till up what is there, prepare a new seedbed, and start all over with a better grass. This represents more work and expense, but it can be cheaper and much more satisfying in the long run.

The ability of Centipede, Tifway Bermuda and Zoysia to crowd out weeds and other grasses make it possible to convert an unattractive lawn to a better grass.

Cut the lawn closely and rake out the dead thatch. Plug in the same manner as recommended for new lawns. Water thoroughly and keep the lawn closely mowed. After the plugs are rooted and new growth is evident, fertilize sparingly (approximately 10 lbs. per 1,000 square feet of 10-10-10 or similar complete fertilizer once plus ammonium nitrate at three pounds per 1,000 square feet every three weeks).

Centi-Seed® is especially good for converting old lawns. Try renting a vertical thinning machine, thin the old lawn, rake out the dead thatch, seed at twice the rate for new lawns, and vertically thin again to mix the seed into the top layer of soil. Water well and regularly. Use little or no fertilizer until late summer, and then apply 10 lbs. complete fertilizer per 1,000 square feet. Mow closely and regularly. Complete instructions for conversion are in the Centi-Seed® package.

### Converting Old Lawns to Zenith

No grass is likely to produce the miracle of choking out weeds and all other grasses, as advertised by sellers of Zoysia plugs, but thousands of ragged lawns can be converted to Zenith Zoysia. Begin in March by killing existing vegetation with Roundup®. Mow closely and remove the dead material. If possible rent a "silt-trench" seeder (a device which opens an incision or slit and drops the seed in the trench) and seed Zenith®. If no such seeder is available, broadcast Zenith® seed at a rate of two pounds per 1,000 square feet and repeatedly aerify, delthatch, or rake vigorously to get the seed in contact with the soil. Water frequently and begin regular mowing as soon as you have anything to mow. Fertilize per directions herein for new lawns. Expect an abundant weed crop, but use it to make a green ground cover. An application of weed and feed fertilizer in March of the next year should result in a good Zenith lawn during the second summer. Be patient, follow directions, and you will be rewarded.

DO NOT Use any type pre-emerge weed control chemical or weed and feed fertilizer for at least 60 days before seeding Zenith. After seeding, do not use any weed control chemical that is not labeled and recommended for Zoysia grasses.

Under favorable conditions, conversion to a better grass can be accomplished in a single season. Generally, a second year is required, but each growing month, the lawn should improve in appearance and your efforts will be well rewarded, even though final results are seldom satisfactory as where one established a new lawn with a selected grass.

## Maintaining Established Lawns

During the establishment period, fertilization, mowing and watering are geared to getting the planting to cover the ground as rapidly as practical. Once a good turf is established, fertilize and water only as necessary to maintain a turf tight enough to resist weed invasion and to keep the grass in a healthy condition so that it is producing adequate growth for a fresh, neat appearance.

### Mowing

Dull mower blades "chew" the grass rather than "clip" it, and leave it with a scared appearance and in unhealthy condition. Always keep your mower sharp. Bermudas and Zoysias may be cut as close as one-half inch. Centipede and Carpet do best at about one inch and Bahias and St. Augustines at 2 to 3 inches. If mowing is delayed until the amount cut off is more than the amount left, the grass will suffer in appearance. Bermudas and Zoysias look better when cut with a reel-type mower. Reel mowers and rotary mowers are satisfactory for the other grasses.

Growth rate of the grasses varies with the presence of moisture, fertility and temperature. Mowing frequency recommended for best appearance during the peak growing season is every 4 to 6 days for Bermudas, every 5 to 7 days for Bahias, Carpet and St. Augustine, every 7 to 10 days for Zoysias and every 10 to 15 days for Centipede. Less frequent mowing is needed during the cool weather of spring and fall except for Bahias, Carpet and seeded Bermudas, which require continued frequent mowing because of the daily production of unsightly seedheads.

### Fertilization

Fertilize Bermudas, St. Augustines and Zoysias in spring and the summer at a rate of approximately 15 lbs. complete fertilizer per 1,000 square feet.

Continue to feed Bermudas during the growing season every 30 to 40 days with approximately two pounds ammonium nitrate per 1,000 square feet. St. Augustines and Zoysias should have one or two supplemental applications of two pounds ammonium nitrate per 1,000 square feet during the summer growing season, best spaced 60 or more days apart. On good soils, Centipede and Carpet will do better if never fertilized. On poor soils, first water well for an extended period of time (several weeks) to be certain that drought is not being confused with hunger. If Centipede continues to appear thin and unthrifty, fertilize with not more than 10 lbs. per 1,000 square feet of a complete fertilizer low in nitrogen. Carpet is usually destroyed by continued fertilization, and if it persists in being thin when well watered, the probabilities are that it is not adapted to your soil.

Once a turf is mature, it produces an abundance of organic material and there is little reason to buy high-priced organic fertilizers. However, there are new, slow release chemical fertilizers on the market which are advantageous for Bermudas, St. Augustines and Zoysias during the summer and early fall. Avoid using in early spring.

### Watering

Frequent, light watering helps the grass to spread more rapidly during the establishment stage. At the same time, frequent light watering will result in a shallow root system and cause the grass to suffer during brief droughts.

The correct program is to water frequently and lightly during the early establishment stage, and as the turf begins to mature gradually change to less frequent, deeper watering.

Once a turf is established, water only to prevent damage or poor appearance during dry periods. When the grass begins wilting before noon, it needs water. When you water, really soak the lawn well. Most sprinklers need to be run several hours at each place before mowing. Such waterings are healthy for the grass, and last a long time. Dig into the soil with a spade to see what is actually being accomplished with water applied.

### Diseases

Plants, like animals, are affected with many diseases. Manage the better grasses as recommended and the disease problems will seldom be serious, as the grass will normally outgrow the disease. Proper disease diagnosis and treatment is difficult at best, but chemicals for disease treatment only will usually hurt nothing but your pocketbook if the chemicals are correctly used, and may often cure the disease. Solicit the advice of your Cooperative Extension Service or a competent nurseryman, and beware of chemicals that are for purposes other than disease control.

### Insects

Good garden stores can supply appropriate insecticides, often in needed fertilizers, for controlling ants, mole crickets and most other small insects.

Chinch bugs can destroy St. Augustines, but good information on control measures is widely available in areas of severe infestation.

The spittle bug can seriously damage any grass, but is not apt to increase population to disastrous levels if the grasses are kept mowed at recommended heights, because the spittle bug likes tall, thick grass.

Bill bugs can be a problem in Zoysia and Tifdwarf Bermuda. Use only chemicals to control, and flush deep into the soil by watering.

Army worms and sod webworms frequently damage Bermudas, but they are easily killed with insecticide and the grass usually recovers after considerable foliage has been eaten by the worms.

### Maintenance Hints

**Cutting** Never mow grass when it is suffering from drought, or the lawn will be discolored and unattractive for several days. During dry seasons, water well a day or two before you expect to mow.

**Watering** The best time to water a new planting is in early afternoon, as it will stay moist throughout the night and early morning. The best time to water established turf is early morning, as this permits the grass to dry and provides fewer hours favorable to the growth of disease bacteria and fungi.

**Fertilizing** There is no way to over-emphasize the importance of fertilizing only after noon when the grass is dry, and then watering well to avoid chemical burn. Fertilizing before a rain or during a rain is asking for trouble, because if the grass is damp fertilizer particles will stick to the foliage and burn if in a matter of minutes.

**Renovation** Soon after a good turf of any grass is matured, a thatch problem develops. Periodic aeration and vertical thinning will benefit almost any lawn. Check with your garden store to see what rental equipment may be available to enable you to renovate your turf.

