



St. Augustinegrass

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Native to the coastal regions of both the Gulf of Mexico and Mediterranean Sea, St. Augustinegrass (*Stenotaphrum secundatum* [Waltz] Kuntze) is widely adapted to both tropical and subtropical regions. In Hawai'i, St. Augustinegrass is commonly used in home lawns and other landscaped areas, as it is adapted to a wide array of soils.

This highly stoloniferous species produces a very dense, dark blue-green, coarse-textured turf (Photo 1) with better shade tolerance than most other warm-season turfgrasses. St. Augustinegrass is often visually confused with centipedegrass (*Eremochloa ophiuroides* [Munro] Hack). The two species differ in that St. Augustinegrass has leaf tips that are more rounded than centipedegrass (Photo 2), and centipedegrass has alternating leaves at

the nodes, whereas the leaves of St. Augustinegrass are arranged opposite one another.

St. Augustinegrass is best suited for areas that receive little use and consequently little maintenance. The species tends to be shallow-rooted and therefore does not withstand drought conditions as well as some other turfgrasses. It is prone to excessive thatch buildup when given large amounts of nitrogen fertilizer and frequent irrigation. St. Augustinegrass has poor tolerance of wear (foot traffic).

Pest problems with St. Augustinegrass can be significant. The major insect pest of this turfgrass in Hawai'i is the chinch bug (Photo 3). Its control will be discussed below. The grass is susceptible to various turfgrass pathogens and is sensitive to many postemergent herbicides.



1. St. Augustinegrass has a coarser (wider) texture than other warm-season turfgrasses.



2. St. Augustinegrass has rounded leaf tips.

*This revises publication TM-3 (1998) of the same title by J. Deputy, D. Hensley, and J. Tavares.



3. Chinch bug (eny3005.ifas.ufl.edu/lab1/Hemiptera/Lygaeid.htm)

Cultivars

As of February 2008, not all varieties listed below are available in Hawai'i due to quarantine restrictions. Contact the authors (brosnan@hawaii.edu, deputy@hawaii.edu) for more information.

There are two categories of St. Augustinegrass cultivars: standard and semi-dwarf. Semi-dwarf cultivars can tolerate mowing heights between 1½ and 2 inches, while standard cultivars require mowing heights between 3½ and 4 inches. Semi-dwarf cultivars also offer improved tolerances to environmental stresses (shade, pests, etc.). Both cultivar categories will be discussed below.

'Amerishade' is a semi-dwarf cultivar that can be maintained at a lower height of cut than other St. Augustinegrass cultivars (1½–2 inches). 'Amerishade' produces a deep green turf with good shade tolerance and a slower growth rate than that of other cultivars. Research has found it to require only two mowings per growing month. 'Amerishade' is highly susceptible to disease and has difficulty recuperating from injury.

'Bitterblue' was a variety selected in the 1930s; however, no certified 'Bitterblue' germplasm exists today. Referred to as a "standard" cultivar, the plant material marketed as 'Bitterblue' today is a fine-textured, dark blue-green cultivar with good shade tolerance. 'Bitterblue' is susceptible to both chinch bug damage as well as leaf spot. 'Bitterblue' has increased sensitivity to triazine herbicides (e.g., atrazine, simazine), which makes weed control difficult in certain situations.

'Delmar' is a semi-dwarf cultivar that produces

a dense, dark green turf tolerant of mowing heights between 1½ and 2½ inches. While having good shade tolerance, 'Delmar' is susceptible to chinch bugs, sod webworms, and the brown patch (*Rhizoctonia solani*).

'Deltashade' is a proprietary cultivar released by Environmental Turf Inc. (Avon Park, FL). It is a standard cultivar requiring regular mowing at heights of 3½–4 inches. 'Deltashade' offers improved shade tolerance compared to other standard cultivars; however, its shade tolerance is not as good as that offered by newer semi-dwarf selections.

'Floralawn' was released by the Florida Agricultural Experiment Station in the mid-1980s. It is a coarse-textured cultivar with poor shade tolerance. While not used extensively today, it is one of the few cultivars available as a certified variety.

'Floratom' is another certified variety. This standard cultivar produces a blue-green, coarse-textured turf. Its collars have a distinctive pinkish color. 'Floratom' offers poor shade tolerance, increased sensitivity to triazine herbicide applications, and susceptibility to gray leaf spot (*Pyricularia grisea*) and brown patch (*Rhizoctonia solani*). Chinch bug resistance has been lost from the cultivar over time.

'Floratine' was released in 1962 by the Florida Agricultural Experiment Station. Aesthetically similar to 'Bitterblue' in overall quality, 'Floratine' is a fine-textured, blue-green, dense cultivar moderately tolerant of shade. It is the most commonly used St. Augustinegrass cultivar in Hawai'i.

'Palmetto' was released by Sod Solutions Inc. (Mount Pleasant, SC) in the mid-1990s. It has shorter leaf blades and internodes than other standard cultivars, and it is susceptible to disease in humid environments.

'Raleigh' is a coarse-textured, medium-green, standard cultivar adapted to acidic and heavy clay soils. Released by North Carolina State University in 1980, 'Raleigh' is susceptible to both chinch bugs and brown patch but has exceptional cold tolerance.

'Seville' is a fine-textured, dark green, semi-dwarf cultivar with a low growth habit. Its leaf texture is finer than 'Floratom'. Developed by the O.M. Scott & Sons Company (Columbus, OH), 'Seville' is susceptible to sod webworm and chinch bug attacks.

Establishment

St. Augustinegrass is established vegetatively by sodding (Photo 4), sprigging, or plugging (Photo 5).



4. Pallets of sod for turfgrass establishment

Sodding

Sodding is the most expensive method of vegetative propagation; however, it provides instant turfgrass cover. The process involves simply laying pieces of sod over moist soil. Note that the soil on which the sod was grown should be of a texture similar to that on which it is being installed. Otherwise, layering will occur in the soil profile, which can have negative effects on root growth. If the soil layers do not match, soil modification (i.e., topdressing) after establishment may be required. Sod without a soil layer (“washed sod”) can be purchased for increased cost.

Sod should be laid in brick-like pattern. The edges of each piece should be fitted tightly together to avoid any open seams. Openings between the edges of sod pieces desiccate quickly. On smaller sites, these seams can be topdressed with soil to ensure that no gaps are present (Photo 6).

After all sod pieces are in place, it is recommended that the site be rolled (Photo 7) and watered. Light, frequent irrigation (four to six times daily) is recommended until roots grow into the underlying soil. If a single piece of sod cannot be lifted off the surface without appreciable force, roots have grown into the soil. Initiate mowing once this occurs. Do not mow beforehand.

Sprigging

Sprigging is a modification of traditional stolonizing. The process involves planting St. Augustinegrass stolons end-to-end in 1–2-inch deep furrows spaced 6–12 inches apart. In the furrow, stolons should be placed



5. Plugs are spaced 6–12 inches apart from one another.

2–4 inches apart from one another. Soil is pushed over the sprigs to level the furrow with the surrounding surface. Do not bury the sprigs in the furrow; leaf blades should remain exposed. After leveling the furrow, the site should be rolled with a lightweight roller. The narrower the spacing between furrows and between sprigs within furrows, the faster the establishment rate. While sprigging does not provide instant turfgrass cover (as with sodding), establishment rates after sprigging are greater than plugging.

Water immediately after the furrows are rolled. Sprigs are subject to drying out, as they are planted at a shallow depth. Light, frequent irrigation (four to six times daily) is recommended until roots become established. Note that the susceptibility to desiccation after sprigging is less than that after traditional stolonizing.

Plugging

Plugging is the most common method of establishing St. Augustinegrass in Hawai‘i. The sod is cut into small pieces (2–4 inches in diameter; square or circular) called plugs. The plugs are planted into the soil on 6–14-inch centers (Photo 5). Increasing plug diameter and decreas-



6. Edges of sod can be topdressed to ensure that no gaps are present.



7. Lightweight rolling after sodding

ing plug spacing will increase the rate of establishment. Specialized mechanical plugging equipment is available for use on large areas.

After planting, roll the plugs lightly and irrigate thoroughly. Maintenance after plugging is the same as after sprigging.

During vegetative establishment there may be a need to control both broadleaf and grassy weeds, as well as sedges. Consult the CTAHR Publication, *Chemical Weed Control Recommendations for Turfgrasses in Hawaii* for more information.

Mowing

Recommended St. Augustinegrass mowing heights vary with growth habit. Standard cultivars ('Bitterblue', 'Classic', 'Floritam', 'Floratine', 'Palmetto', etc.) have a more upright growth habit and should be mowed at heights of 3–4 inches. The newer semi-dwarf cultivars have a lower growth habit and should be mowed at 1½–2½ inches.

Mowing frequency should be adjusted so that no more than one third of the leaf blade is removed at a time. Mowing at heights lower than recommended reduces the plant's stress tolerance, discourages deep rooting, and may increase susceptibility to weed, disease, and insect problems.

St. Augustinegrass is easily maintained with a rotary mower (Photo 8). Mower blades should be sharpened regularly. Mowing with dull blades causes tearing and bruising of leaf tissues, conditions associated with

increased disease incidence. Monthly sharpening is recommended..

Irrigation

Established St. Augustinegrass should be irrigated on an "as-needed" basis. When leaf blades show signs of slight wilt, irrigate the turf heavily, applying about 3/4 inch of water. Do not water again until the next time signs of wilt are apparent. Do not vary the amount of water applied each time. Deep, infrequent irrigation on an "as-needed" basis helps the plant develop a deeper root system and encourages greater resistance to pests and environmental stress.

Nutrient management

Fertilizer applications are required to maintain a quality St. Augustinegrass turf. A total of 4–6 pounds of nitrogen per 1000 sq ft should be applied to St. Augustinegrass annually. Phosphorus and potassium requirements are best based on soil test recommendations. If deficient soil levels of these nutrients are not detected, applications may not be required.

Fertilizer applications should be evenly spaced throughout the growing season. Never apply more than 1 lb of nitrogen per 1000 sq ft in any application. Both quick- and slow-release fertilizers can be used to maintain St. Augustinegrass. Slow-release materials can be applied less frequently and at higher rates than soluble (quick-release) fertilizers.

Do not exceed the recommended nitrogen fertility



8. Rotary mower



9. Vertical mower used to remove thatch (photo, J.A. Borger)

levels. Excess nitrogen fertilization can lead to excessive thatch buildup, reduced rooting, and increased susceptibility to disease and insect damage. For more information on fertilizers, see CTAHR Publication TM-13, *Turf Fertilizers for Hawaii's Landscapes*.

Thatch buildup

Thatch is a layer of undecomposed organic matter intermingled with live plant stems at the soil surface. Excessive thatch develops when the lawn is overfertilized, overwatered, or improperly mowed. However, leaving clippings on the surface after mowing does not cause thatch buildup.

Excessive thatch can limit root growth, harbor insects and disease, and reduce the efficacy of some pesticide applications. If the thatch layer exceeds $\frac{1}{2}$ inch, vertical mowing is required. Vertical mower blades penetrate into the surface (Photo 9), removing thatch buildup at the soil-turfgrass interface. The blades should be spaced approximately 3 inches apart for St. Augustinegrass. This is significantly wider than the spacing used for bermudagrass (*Cynodon* species), seashore paspalum (*Paspalum vaginatum*), or zoysiagrass (*Zoysia* species). The blades should not be set deep enough to penetrate the soil surface; there should be at least $\frac{1}{2}$ inch of plant material between the bottom of the blade and the soil surface. Reducing blade spacing and/or increasing blade penetration depth will damage the existing turfgrass stand. Debris (thatch) brought to the surface after vertical mowing can be raked, vacuumed, or blown off, but

its removal is essential.

Vertical mowing will damage the existing turfgrass stand. To reduce recuperation time, vertically mow only during periods of active growth. To promote recuperation, irrigate deeply after vertical mowing and apply 1 pound of nitrogen per 1000 sq ft.

Weed control

St. Augustinegrass is sensitive to many postemergence herbicides. For example, never apply MSMA or CMA to St. Augustinegrasses, as these materials will cause severe damage. St. Augustinegrass is sensitive to 2,4-D as well. Herbicide tolerances vary with the cultivar. Products labeled for use in St. Augustinegrass sod production should not be applied on golf courses or other landscape sites. Always read the entire label before applying any herbicide.

Combinations of 2,4-D, MCPP, and dicamba are commonly used for postemergence broadleaf weed control in St. Augustinegrass. Application rates for St. Augustinegrass are lower than those of other warm-season turfgrasses due to the species' sensitivity to 2,4-D. Kyllingas (*Kyllinga* sp.) and purple nutsedge (*Cyperus rotundus*) can be controlled with applications of halosulfuron (SedgeHammer[®]; formerly Manage[®]) and sulfosulfuron (Certainty[®]).

Many preemergence herbicides can be safely used on St. Augustinegrass including pendimethalin (Pre-M[®]), oxadiazon (Ronstar[®]), and dithiopyr (Dimension[®]). Refer to the CTAHR publication *Chemical weed control*

recommendations for turfgrasses in Hawaii for more information on selecting herbicides for use on St. Augustinegrass.

Insects

The major insect pest of St. Augustinegrass is the chinch bug (Photo 3). Chinch bugs are foliar-feeding insects that suck juices out of the plant, causing the appearance of chlorotic patches throughout the turf. Many insecticides provide control including bifenthrin (Talstar®), carbaryl (Sevin®), deltamethrin (DeltaGuard®), and trichlorfon (Dylox®). Always read the insecticide label before application.

Other possible insect pests include the webworm and armyworm, and white grubs. Most insecticides provide broad-spectrum control of a many different insect pests. Rotating insecticides is recommended to prevent the development of resistant populations.

Diseases

Brown patch and gray leaf spot are major disease problems of St. Augustinegrass. Brown patch is more likely to occur in warm, humid weather and is encouraged by

excessive nitrogen fertilizer applications. Gray leaf spot is more prevalent during rainy periods and is encouraged by overwatering. There are many fungicide options for controlling these diseases. Always read the product label before application to determine suitability and proper application procedures. Rotating fungicides is recommended to prevent the development of resistant strains.

Acknowledgment

Photo 3 is by James Castner, Univ. of Florida. Photo 9 is by J.A. Borger. All other photos are by J. Brosnan.

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