BERMUDAGRASS

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Figure 1. The majority of bermudagrass (*Cynodon spp.*) varieties produced and sold as sod in Tennessee are seed sterile, vegetatively established hybrids. Photo credit: Tom Samples.

In areas of the United States where the major turfgrass species are Kentucky bluegrass (*Poa pratensis* L.) and tall fescue (*Festuca arundinacea* Schreb.), most people have primarily seen bermudagrass maintained as turf while playing golf, attending a sporting event, visiting friends and family, or vacationing in a coastal area of Virginia, North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, Texas or California.

Figure 2. Bermudagrass spreads by stolons and rhizomes. Photo credit: Tom Samples.

The first introduction of bermudagrass into the United States most likely came in the mid-1700s, possibly from contaminated hay used as bedding on ships sailing from Africa to America. Most of the varieties produced and marketed as sod in Tennessee are hybrids of two species, *Cynodon dactylon* (L.) Pers. and *Cynodon transvaalensis* Burtt-Davy (Figure 1). The word Cynodon is derived from the combination of two Greek words, Cyn, from the word kynos, meaning dog, and odon, from the word odontos, meaning tooth. Dog tooth references the hard and sharp scales on the aboveground (stolons) and below ground (rhizomes) stems (Figure 2). Rhizomes and roots can reach a soil depth of 40 inches or more. Although they have inflorescences, these hybrids known as vegetative or clonal types are sterile and produce little if any seed. However, plant breeders continue to develop turf-type varieties of common bermudagrass (*C. dactylon*) referred to as seeded types that are prolific seed producers, several of which have improved stand density, color, disease resistance and low-temperature tolerance. Both vegetative and seeded type bermudagrasses are managed as athletic fields, lawns and recreational and golf course turfs in Tennessee (Figure 3).

IDENTIFICATION

Both the upper and underside of leaves of bermudagrass may be smooth or hairy. The midvein appears as a slight fold in the center of the leaf and runs parallel to the edges. The leaf tip is sharply pointed (Figure 4) and the ligule, which is found at the junction of the leaf sheath and leaf blade, is a fringe of hairs (Figure 5). The collar is continuous and has visible hairs near the base of the leaf blade. Plants have no auricles (small outgrowths from the base of the leaf blade at the collar). A bermudagrass seedhead has from three to six or more spikes atop a flowering stem and resembles a bird's foot (Figure 6).

Figure 3. Bermudagrass is a popular choice for use in many lawns, athletic fields and golf courses in Tennessee. Photo credit: Tom Samples.

Figure 4. The tip of a bermudagrass leaf is sharply pointed. Photo credit: Tom Samples.

Figure 5. The bermudagrass ligule, which is found at the junction of the leaf sheath and leaf blade, is a fringe of hairs. Photo credit: Tom Samples.

GROWTH HABIT

Plants spread by both stolons and rhizomes. Leaves and stems turn straw-brown in color as plants enter dormancy in late fall or early winter (Figure 7). A healthy, actively growing bermudagrass turf is dense, resistant to weed invasion and capable of recovering from injury very quickly. Due, in part, to their rapid rate of growth and the volume of plant tissue they produce, bermudagrass turfs develop excessive thatch. Thatch is the tightly intermingled layer of living and decaying stems, leaves and roots found at the soil surface (Figure 8). The turf should be dethatched when the thatch layer reaches a depth of one-half inch.

ADAPTATION/FERTILIZER REQUIREMENT

Bermudagrass turfs grow best in full sun and usually become sparse and weedy in medium to heavy shade. Although plants are adapted to soils ranging in texture from sand to clay, they do not usually perform well in infertile soils that stay wet for extended periods. Depending on management intensity level, the nitrogen (N) fertility requirement of bermudagrass ranges from one-half to one-and-one-half pounds of N per one-thousand square feet per growing month. Plants grow best in slightly acidic soil with, in addition to N, proper amounts of phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S) and the micronutrients boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), nickel (Ni) and Zinc (Zn). Soil samples can be sent to the University of Tennessee Soil Testing Lab in Nashville for nutrient analysis. A standard nutrient test includes soil pH, buffer pH, phosphorus, potassium, calcium, magnesium, zinc, manganese, iron, sodium and boron. Fertilizer and lime recommendations are also provided. Information about soil sampling and pricing information is available online at soillab.tennessee.edu/soil-fertility.

Figure 6. The bermudagrass seedhead has three to six or more spikes atop a flowering stem and resembles a bird's foot. Photo credit: Tom Samples.

Figure 7. In Tennessee, bermudagrass turfs are dormant during winter. Photo credit: Tom Samples.

Figure 8. The thatch layer is located between the zone of green vegetation and the soil surface. Photo credit: Tom Samples.

DISEASES/INSECTS/WEEDS

Bermudagrass is susceptible to several fungal diseases including dollar spot (*Clarireedia spp.*), large patch (*Rhizoctonia solani*), pink snow mold/microdochium patch (*Microdochium nivale*) and spring dead spot (*Ophiosphaerella spp.*) (Figure 9). Common insect pests of bermudagrass include armyworm (*Mythimna unipuncta*), fall armyworm (*Spodoptera frugiperda*) (Figure 10) and the larvae of several species of Scarab beetles including green June beetle (*Cotinus notida*) (Figure 11), Japanese beetle (*Popillia japonica*), May beetle (*Phyllophaga spp.*) and southern masked chafer (*Cyclocephala lurida*). Crabgrasses (*Digitaria spp.*), goosegrass (*Eleusine indica*) and prostrate spurge (*Chamaesyce maculata*) may invade actively growing bermudagrass turf. The winter annual grassy weed annual bluegrass (*Poa annua*) (Figure 12) and winter annual broadleaf weeds such as common chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*) and purple deadnettle (*Lamium purpureum*) (Figure 13) may become problematic while bermudagrass is dormant. Perennial weeds with energy-rich, below-ground bulbs or tubers such as yellow nutsedge (*Cyperus esculentus*) (Figure 14),

Figure 9. The disease spring dead spot is caused by fungal pathogens in the genus *Ophiosphaerella.* Photo credit: Alan Windham.

Figure 10. Fall armyworm (*Spodoptera frugiperda*) larvae (caterpillars) damage bermudagrass by stripping leaves and stems. Photo credit: Frank Hale.

Figure 11. Several species of Scarab beetles including green June beetles *(Cotinus notida)* damage bermudagrass plants as they feed on roots. Photo credit: Frank Hale.

Figure 12. Annual bluegrass (*Poa annua*) in a dormant common bermudagrass golf course rough. Photo credit: Tom Samples.

green (*Kyllinga brevifolia*) and false-green (*Kyllinga gracillima*) kyllinga, wild garlic (*Allium vineale*) and wild violet (*Viola spp.*) can become problematic as they compete with bermudagrass plants for water, nutrients, light and space.

VEGETATIVE, CLONAL TYPES

The first recorded release of an improved, turf-type bermudagrass variety occurred in 1947 with the release of 'U-3' by the United States Golf Association in cooperation with the United States Department of Agriculture. This variety was found growing on a golf course in Savannah, Georgia, in 1938. In 1956, the soft, low-growing sterile hybrid variety 'Tifgreen' was released by the Georgia Agriculture Experiment Station and the United States Department of Agriculture Agricultural Research Service Crops Research Division. 'Tifway,' another sterile hybrid variety selected and cooperatively evaluated by the United States Department of Agriculture, the Georgia Coastal Plain Experiment Station, and the United States and Southern Golf Associations, was released to sod growers in 1960. For many years, these two varieties with the prefix 'Tif-,' one recommended for use as golf greens and intensely managed lawns, the other for golf course fairways, sports turfs and lawns, have served as standards to which newer bermudagrasses are still compared.

Figure 13. Winter annual broadleaf weeds such as purple deadnettle (*Lamium purpureum*) often invade dormant bermudagrass turf. Photo credit: Tom Samples.

Some vegetatively established varieties of bermudagrass have been observed growing naturally and collected, while others have been developed and released from turfgrass breeding programs.

Figure 14. Spreading and low-growing perennial weeds with energy-rich tubers such as yellow nutsedge (*Cyperus esculentus*) often compete with bermudagrass for sunlight, nutrients and water. Photo credit: Tom Samples.

Table 1. Year of introduction and method of development of selected, vegetatively established bermudagrass varieties.

VARIETY, ACCESSION (AN), REGISTRATION (RN) AND PATENT PROTECTION (PP) #S	YEAR OF INTRODUCTION, AGENCY, INSTITUTION OR COMPANY	COMMENTS
Astro (Astro) Unpatented	2017, Oklahoma State University	Chance find in 'Tifway' bermudagrass in Astrodome in Houston, Texas, in the late 1960s.
GN-1 US6841P (CT-2 in Australia, AU1601988 A)	1989, H&T Whiting Turfgrass Development	Released after seven years of breeding in California and three generations of crosses of six bermudagrasses from Africa, Australia and the United States.
Latitude 36® (OKC1119) PP24271	2012, Oklahoma Agricultural Experiment Station, Oklahoma State University	*C. dactylon* (accession A 12198) × *C. transvaalensis* (OSU selection '2747' from Oklahoma State University internal holdings).
Midlawn USPP8162P	1991, Cooperative release by the Kansas and Oklahoma Agricultural Experiment Stations	Developed at the Kansas Agricultural Experiment Station.
Northbridge® (OKC1134) PP24116	2010, Oklahoma Agricultural Experiment Station, Oklahoma State University	*C. dactylon* var. *dactylon* (accession 3200E 4-1) × *C. transvaalensis* (Oklahoma State University selection '2747').
Patriot (OKC 18-4) Field Nursery Identity 4200 TN 26-8 USPP16801P2	2002, Oklahoma State University Bermudagrass Breeding and Development Team	The maternal parent of 'Patriot' is 'Tifton 10' bermudagrass, which was crossed with the pollen parent, *C. transvaalensis*.
Quicksand	1993, United States Department of Agriculture- Natural Resources and Conservation Service and the University of Kentucky Agricultural Experiment Station	Selected from an old bermudagrass stand of unknown origin at the Quicksand, Kentucky, Plant Materials Center.
Tahoma 31 (OKC1131) Plant Patent applied for, patent pending	2017, Oklahoma Agricultural Experiment Station, Oklahoma State University	Developed by crossing *Cynodon dactylon* var. *dactylon* Pers. accession A12268 with *C. transvaalensis* Burtt-Davy Oklahoma State University selection '2747'.

VARIETY, ACCESSION (AN), REGISTRATION (RN) AND PATENT PROTECTION (PP) #S	YEAR OF INTRODUCTION, AGENCY, INSTITUTION OR COMPANY	COMMENTS
Tifdwarf (Reg. No. 8)	1965, Georgia Coastal Plain Experiment Station and Plant Science Research Division, Agricultural Research Service	Found growing on Tifgreen golf greens at Country Clubs in Florence, South Carolina, and Sea Isle and Thomasville, Georgia. First seen in 1990 in Tifton, Georgia, as a dense, off type in a plot named Mutant number 2 derived from irradiated, dormant stolons of 'Tifway II' in January 1988 and mowed at a height of six millimeters beginning in Spring 1989.
TifGrand® (93-92, 94-18, 97-4, 00-07, Tift#4, ST-5) PP21017	2009, University of Georgia, Wayne Hanna and S. Kristine Braman	Evaluated for nine years in three full sun and three shade tests in Tifton, Georgia, where it was also evaluated for insect resistance.
Tifgreen® (Tift-328)	1956, Georgia Agriculture Experiment Station and United States Department of Agriculture Agricultural Research Service Crops Research Division	Inter-specific hybrid created in 1951 by crossing *C. dactylon* collected from Green #4 of the Charlotte Country Club (North Carolina) and *C. transvaalensis*.
TifSport (Tift 94)	1995, United States Department of Agriculture Agricultural Research Service and the University of Georgia Coastal Plain Experiment Station	One of sixty-six finer-textured mutants induced by gamma-radiation of Midiron bermudagrass.
Tifton 10	1988, Georgia Coastal Plain Agricultural Experiment Station and the Agricultural Research Service	Originally collected in Shanghai, China, in 1974.
TifTuf® (DT-1) PP27,392P2	2015, University of Georgia Research Foundation, Inc and United States Department of Agriculture	Inter-specific hybrid of the genus and species *C. transvaalensis* x *C.dactylon*. Systematically assessed since 2002 in three drought trials and two normal input trials in Tifton, Georgia, before release.

VARIETY, ACCESSION (AN), REGISTRATION (RN) AND PATENT PROTECTION (PP) #S	YEAR OF INTRODUCTION, AGENCY, INSTITUTION OR COMPANY	COMMENTS
Tifway (Tift-419)	1960, United States Department of Agriculture, Georgia Coastal Plain Experiment Station, and U. S. and Southern Golf Associations	A chance hybrid discovered in 1954 in a seed lot from Africa by former United States Department of Agriculture turfgrass breeder Glen Burton who was instrumental in its development and eventual release.
Tifway II	1971, United States Department of Agriculture Agricultural Research Service- Southeast Area and Georgia Coastal Plain Experiment Station	Mutant resulting from irradiated, dormant sprigs of 'Tifway'.
Vamont (VPI C-1)	1980, Virginia Agricultural Experiment Station	Collected after being found in 1972 growing on a golf course fairway near North Wilkesboro, Virginia.

They vary in overall quality and traits such as leaf texture, color, stand density, vertical and lateral growth rate, shade tolerance, water use rate, low-temperature hardiness, and disease and insect resistance.

Table 2. Characteristics of selected, vegetatively established bermudagrass varieties.

VARIETY	CHARACTERISTICS
Astro	Triploid interspecific hybrid propagated vegetatively; high light requirement; excellent overall turf quality, dense, medium textured (like that of 'Celebration' and 'Patriot'), fast recovery and good wear resistance; similar overall quality to 'Celebration' and 'Patriot'; lighter in color than several other vegetative types; slightly slower to transition from winter dormancy compared to several other bermudagrasses.
GN-1	Dark green color, medium-fine textured, good low-temperature hardiness, excellent wear tolerance, upright leaves and improved nematode resistance.
Latitude 36	Triploid interspecific hybrid propagated vegetatively; excellent overall turf quality, fine texture, improved cold hardiness, high sod density, and very good sod tensile strength, wear tolerance and recovery rate; narrower leaves and shorter internodes than 'Tifway'; level of freeze tolerance similar to 'Midlawn' and superior to 'Tifway'; color resembling that of 'Tifway' and lighter green than 'Patriot'; stem diameter equivalent to that of 'Tifway'; may transition from winter dormancy quicker than several other varieties.

VARIETY	CHARACTERISTICS
Midlawn	Slow-growing, dark-green hybrid ranks high for overall turf quality, texture, density, spring green-up and spring dead spot resistance; much better cold tolerance than that of 'Tifgreen' but may be less than that of 'Vamont'; similar in overall quality to when managed at a medium-high intensity level.
Northbridge	Excellent overall turf quality, fine texture, improved cold hardiness, early spring green-up, high sod density, and very high sod tensile strength; similar leaf blade length and leaf blade width to 'Tifway' with a larger internode diameter than 'Tifway'; 'Northbridge' has a lighter green color than 'Patriot' and similar to 'Tifway'; sod density is slightly higher or equal to 'Tifway'; salinity tolerance better than or equal to 'Tifway'; slightly better winter hardiness than 'Latitude 36.'
Patriot	Excellent aerial shoot survival during winter, short internodes and high shoot density; rapidly establishes from sprigs, has demonstrated resistance to spring dead spot; suitable for many applications including golf course fairways and tees, athletic fields, home and commercial landscape sites, and parks and playgrounds.
Quickstand	Establishes and spreads very rapidly, medium-green leaves; does not appear to produce pollen, thinner leaves compared to 'Vamont'; good winter hardiness, and has a low incidence of spring dead spot.
Tahoma 31	Excellent overall turf quality, fine texture; exceptional winter survivability, early spring green-up; superior traffic tolerance, and improved drought resistance through lower water use rate; similar overall quality to 'Tifway', yet finer leaf texture; slightly lighter in color than 'Tifway' and 'Patriot' but darker than 'Latitude 36.'
Tifdwarf	Darker green dwarf-type, with smaller stems and leaves, and shorter internodes than 'Tifgreen'; more tolerant of close mowing than 'Tifgreen'; plants often turn purple after being exposed to freezing temperatures.
TifGrand	Dense, naturally dark green color (darker than that of 'Tifgreen'), fine leaf texture; improved shade tolerance, excellent resistance to tawny mole cricket; requires less nitrogen and water inputs than several other warm season turfgrasses.
Tifgreen	Low-growing, disease-resistant, rapidly spreading; forms very few seed heads and tolerates overseeding with perennial ryegrass better than several other varieties; plants are forest green and have soft, narrow leaves; withstands mowing heights less than three-sixteenths inch.
TifSport	Like 'Tifgreen' in overall turf quality; cold tolerance allows the variety to be grown as far north as Stillwater, Oklahoma, and Lexington, Kentucky.

VARIETY	CHARACTERISTICS
Tifton 10	Coarse-textured with bluish-green leaves; drought-resistant, tolerant of hot temperatures; selected for ease of establishment from stolons and overall turf quality; improved ring nematode (*Criconemella ornata*) tolerance.
Tifway	Has served as the traditional standard bermudagrass for golf, sport and lawns; high stand density and sod tensile strength; darker green and more frost resistant than 'Tifgreen'; highly disease resistant and recovers quickly from wear injury.
Tifway II	Medium dark green color, dense, medium-fine leaf texture (slightly coarser than 'Tifway') and vigorous growth rate; tolerant of heavy traffic, poor irrigation water quality and drought; may transition from winter dormancy before 'Tifway'; Improved resistance to sting (*Belonolaimus spp.*), root knot (*Meloidogyne spp.*) and ring (*Criconemella spp.*) nematodes.
TifTuf	Upright, excellent drought tolerance, superior wear and traffic tolerance; fast growth rate, prolonged color retention; small seed head, rarely produces pollen or seed, and thrives in hot and humid conditions; showed 90 percent survivability in temperatures as low as -6 degrees Fahrenheit.
Vamont	Vigorous and traffic tolerant; medium-green color, texture and stand density; coarse, rapidly growing stolons; improved low-temperature hardiness contributes to its adaptation throughout the northern turfgrass transition zone; easy to overseed with perennial ryegrass for fall, winter and early spring color during bermudagrass winter dormancy due to openness of foliage.

VEGETATIVE, ULTRA-DWARF CLONAL TYPES

In Tennessee, ultra-dwarf varieties such as 'Champion Dwarf,' 'Mini-Verde' and 'TifEagle' have replaced 'Tifgreen' and 'Tifdwarf' as varieties of choice for newly constructed or renovated greens.

Table 3. Characteristics and development of selected, vegetatively established ultra-dwarf bermudagrass varieties.

VARIETY (EXPERIMENTAL DESIGNATION) PATENT NUMBER, DATE	AGENCY, INSTITUTION OR COMPANY	CHARACTERISTICS
Champion Dwarf USPP09888, May 1997	Coastal Turf Inc.	A vegetative selection from 'Tifdwarf' collected in Texas; very dense with a fine leaf width; high rate of development of lateral stems; thatch accumulation comparable to 'TifEagle'; low N fertility requirement; often produces greater root mass than 'TifEagle.'

VARIETY (EXPERIMENTAL DESIGNATION) PATENT NUMBER, DATE	AGENCY, INSTITUTION OR COMPANY	CHARACTERISTICS
Emerald Dwarf USPP19974P3, May 2009	Coastal Turf Inc.	Selected from a segregated patch found on a 'Tifdwarf' putting green in Houston, Texas, in 1992; more rhizome development, greater root mass and rooting depth, and improved uniformity during transition from winter dormancy compared to several other ultra-dwarf varieties.
Mach 1 RL-1 ACE Dwarf PP31139, May 2018	Modern Turf Selected and developed by Rod Lingle, Golf Course Agronomist and Certified Golf Course Superintendent	Found growing on a golf green in the Memphis, Tennessee, area in 1998; rapid rate of lateral stem development and superior stand density, noticeably short internode length and fine texture contribute to excellent ball roll and green speed; heat and drought tolerant; responds positively to routine growth regulator applications; excellent genetic purity with no visible off types or seedhead development.
MiniVerde (P18) PP12084, September 2001	Modern Turf	A vegetative selection from what is believed to be a mutant of 'Tifdwarf'; primarily selected based on improved stand density, fine leaves, uniform green color and rapid lateral growth rate; shorter root structure than 'Tifdwarf.'
MS Supreme (MSB40) PP11781, February 2001	Mississippi Agricultural and Forestry ES	Discovered growing in a 'Tifgreen' golf green on the Gulf Shores Country Club, Gulf Shores, Alabama; forest green color with a short leaf blade (four to eight millimeters) and fine leaf width (four-tenths to one millimeter); excellent aerial shoot density and a highly prostrate growth habit; maintains uniform color under cloudy conditions and in the fall; identified as *Cynodon* x *magennisii*.
Sunday C-7 USPP026638, April 2016	Sod Solutions, Inc Primary developer, John Chapman Contributors to this selection include R. C. Craft, Robert Craft, John Chapman, and Burr Johnson.	Selected in 2007 from an undefined green on Cotton Creek Golf Club, Golf Shores, Alabama, that was originally established from sprigs designated as 'C-1' bermudagrass in April 1987; selection criteria included genetic stability, canopy density, lighter green color and limited seedhead production; can be mowed at a height of eight-one-hundredths inch.

VARIETY (EXPERIMENTAL DESIGNATION) PATENT NUMBER, DATE	AGENCY, INSTITUTION OR COMPANY	CHARACTERISTICS
TifEagle USPP11163P, December 1999	1997, United States Department of Agriculture, Agricultural Research Service, Inventor: Wayne Hanna, Coastal Plain Experiment Station	Dense and fine-textured; improved color and overall quality compared to 'Tifdwarf'; produces more aerial shoots per unit area, and has shorter and narrower leaves than 'Tifdwarf'; improved resistance to tawny mole cricket (*Neoscapteriscus vicinus*) once the turf is mature.

Both 'Champion Dwarf' and 'MiniVerde' are selections from naturally occurring mutations in the variety 'Tifdwarf.' 'TifEagle' was originally found in 1990 as a dense, off-type in a bermudagrass plot designated Mutant number 2 in Georgia that was derived from irradiated dormant stolons of 'Tifway II' bermudagrass. These bermudagrasses generally have shorter internodes, much higher shoot densities, better overall turf quality and the ability to withstand lower cutting heights than either 'Tifgreen' or 'Tifdwarf.' Along with the improved overall putting surface of the ultra-dwarf bermudagrasses comes the need for a change in conventional bermudagrass greens management practices. Research shows that ultra-dwarf bermudagrasses are often shallowly rooted and can quickly produce excess thatch. Due, in part, to their high aerial shoot densities, they may also prove challenging to topdress with sand. For example, uniform, frequent and light topdressing followed immediately by irrigation rather than using a drag mat to move sand into the thatch may reduce leaf shredding and stolon damage. In addition to topdressing, routine vertical mowing, rolling (with a lightweight greens roller) and applications of a suitable wetting agent and plant growth regulator may also be beneficial. At times, two layers of winter protective blankets may be necessary to prevent severe low-temperature injury and desiccation in winter.

SEEDED TYPES

Much of the bermudagrass seed marketed in Tennessee is produced in Arizona where two seed harvests per year may be possible. 'Common,' also referred to as 'Arizona common' bermudagrass, has traditionally been planted to establish lawns, sports fields, utility turfs, pastures and erosion-resistant groundcovers throughout the south. However, 'Common' bermudagrass is generally lighter in color, less dense, coarse textured, has a limited root mass, and is more prone to low temperature and frost injury than many vegetatively established hybrids or improved seeded types.

The improved, seeded types 'Riviera' and 'Yukon' have better overall turf quality, low-temperature tolerance, rooting and spring dead spot resistance than 'Common' bermudagrass. Other improved, seeded types with greater cold tolerance presently marketed for use in Tennessee include 'Arden 15,' 'Blackjack,' 'Casino Royale,' 'Highlander,' 'Mirage II,' 'Monaco,' 'North Shore SLT,' 'Rio,' 'Sahara II,' 'Sunbird' and 'Transcontinental.' Some companies also blend seed of two or more compatible bermudagrass varieties.

VARIETY COMPARISONS

Information about the performance of individual vegetative and seeded type bermudagrass varieties in several states is published on the National Turfgrass Evaluation Program website, www.ntep.org. The National Turfgrass Evaluation Program is designed to develop and coordinate uniform evaluation trials of turfgrass varieties and

promising selections in both the United States and Canada. Plant breeders use test results to evaluate the broad adaptation of a particular variety in development. Results are also used to decide how well a variety may perform in a local area or at a high, medium or low level of management intensity. The first bermudagrass test began in 1986 and was completed in 1991. Only seven of the twenty-eight entries were seeded types. However, a few of them are still found growing in Tennessee. Sixteen of the twenty-six entries in the 1992 National Bermudagrass Test, eighteen of the twenty-eight entries in the 1997 National Bermudagrass Test, twenty-nine of the forty-two entries in the 2002 National Bermudagrass Test, twenty-five of the thirty-one entries in the 2007 National Bermudagrass Test, and eighteen of the thirty-five entries in the 2013 National Bermudagrass Test produce viable seed. The most recent National Bermudagrass Test was planted in 2019 in nineteen locations in fifteen states, including Tennessee. Twenty-two entries are vegetative types and thirteen are seeded types. Most visual ratings of the bermudagrass entries in National Turfgrass Evaluation trials are based on a rating scale of one to nine, with one being poorest or lowest and nine being the best or highest rating. Characteristics including winter kill and percent living ground cover are rated by evaluators on a percentage basis.

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