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ENH11

Zoysiagrass for Florida Lawns[1]

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Zoysiagrasses (*Zoysia* spp.) were introduced into the United States from Asia and provide attractive turf throughout much of the United States. In recent years, dramatic improvements in zoysiagrass have been made by turfgrass breeders. These improvements include insect resistance, accelerated establishment, and overall performance. Zoysiagrasses are adapted to a variety of soil types and have good tolerance to shade, salt, and traffic. They provide an extremely dense sod that resists weed invasion, but certain pests can be problematic.

Zoysiagrass maintenance is different from that of other Florida lawn grasses. When improper maintenance practices are followed, undesirable results are likely to occur. Table 1 provides a quick comparison of zoysiagrass to other lawn grasses.

Table 1. A generalized comparison of zoysiagrass to common lawn grasses grown in Florida

	Centipedegrass	**St. Augustinegrass**	**Zoysiagrass**
Mowing height	1.5"–2.5"	Cultivar dependent (2"–4")	Cultivar dependent (0.25"–2.5")
Mower type	Rotary	Rotary	Reel-type or rotary
Annual fertility requirement	1–2 lbs N/1000 ft^2	2–6 lbs N/1000 ft^2	4–6 lbs N/1000 ft^2
Grassy-weed herbicides	Preemergence – many Postemergence – few	Preemergence – many Postemergence – none	Preemergence – many Postemergence – many
Broadleaf weed herbicide tolerance	Many are damaging.	Many are damaging.	Most are safe.
Insects	Spittlebugs Ground Pearls	Chinch Bugs Sod WebwormWhite Grubs	Hunting Billbugs Mole CricketsWhite Grubs
Diseases	Centipedegrass Decline	Take-all Root Rot Large PatchGray Leaf Spot	Large Patch Dollar SpotRust
Comparative Water Use	Persists on less water but can wilt quickly in the absence of water.	Moderate – wilts, but some leaves remain green for longer periods of time.	Moderate, but can wilt quickly in the absence of water. Within 1–2 weeks, the leaves will be brown and the turf will go dormant.

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Cultivars

Several species and varieties of zoysiagrass are used for residential and commercial landscapes, athletic fields, and golf course tees, fairways, and roughs. They vary widely in leaf color, texture, and establishment rate.

Zoysia japonica

This species was introduced into the United States in 1895 and is commonly called Japanese or Korean lawn grass. Cultivars from this species are generally coarse-textured grass with hairy, light green leaves. Of all the zoysiagrasses, this species has a faster growth rate and exhibits excellent cold tolerance. *Zoysia japonica* is the only zoysiagrass for which seed is commercially available; however, the seeded varieties generally do not produce as high-quality turf as do the vegetatively propagated (sodded or plugged) varieties. They can be used for lawns or general turf areas where convenience of establishment by seed is more important than quality.

Zoysia matrella

Also called Manilagrass, this species was introduced into the United States in 1912 from Manila. It produces a finer and denser turf than *Zoysia japonica,* but is less winter hardy and slower growing. Manilagrass resembles bermudagrass in texture, color, and quality and is recommended for a high-quality, high-maintenance turf where a slow rate of establishment is not a disadvantage.

Zoysia tenuifolia

Also called Mascarenegrass or Korean velvet grass, this species is the finest-textured and densest zoysiagrass available. It has good wear tolerance but poor cold tolerance and is only adapted to the central and southern areas of the state. It also produces an excessive thatch, giving it a puffy appearance. This species is often used for low-growing, ornamental specimen plants, especially in Asian-themed gardens.

Although information is available on the Internet about a number of zoysiagrass varieties, at the present time only a few are commercially available in Florida. Based on research information and anecdotal observations, following is a summary of what to expect:

'De Anza'

'De Anza' is a medium- to small-leaf zoysiagrass patented by the University of California in 1995. It has good shade and drought properties and retains color longer than most zoysiagrasses during the fall. 'De Anza' ranked favorably in the National Turfgrass Evaluation Program (NTEP) (Table 2).

'Diamond'

'Diamond' is an improved *Zoysia matrella* that is vegetatively propagated. It was released from Texas A&M University in 1996. 'Diamond' is distinguished from other zoysiagrasses by its fine texture and excellent salt and shade tolerance. It performs best when mowed at a height of ½ inch or less. In fact, 'Diamond' has been planted on several experimental golf greens mowed at ¼ inch or lower. Like other zoysiagrasses, it has poor cold tolerance, which may limit its use in northern parts of the state, and it is highly susceptible to tropical sod webworms.

'El Toro'

'El Toro' is an improved *Zoysia japonica* released in 1986 from California. It has a faster establishment rate, improved cool-season color, better cold tolerance, and less thatch buildup than 'Meyer' zoysiagrass. 'El Toro' is also reported to have early spring green-up, more shade tolerance, and improved resistance to rust disease. 'El Toro' performed well in the NTEP trials conducted in Gainesville, Florida, and the greater Pensacola, Florida, area from 1997–2000 (Table 2).

'Emerald'

'Emerald' zoysiagrass is a selected hybrid between *Zoysia japonica* and *Zoysia tenuifolia* developed in Tifton, Georgia, and released in 1955. This hybrid combines the winter hardiness, color, and faster growth rate of one parent with the fine texture and density of the other parent. 'Emerald' resembles Manilagrass in color, texture, and density, but is faster spreading and has a wider adaptation. 'Emerald' zoysiagrass is highly recommended for top-quality lawns where time and money allow for adequate maintenance. 'Emerald' produces an excessive thatch layer and is susceptible to dollar and leaf spot. Large (brown) patch disease also can occur.

'Empire'

'Empire' is a cultivar that is gaining popularity in Florida. It is similar in texture to 'El Toro' and has a very dense growth habit. It maintains a nice green color and, compared to other new zoysiagrass cultivars, it has a moderate rate of establishment. 'Empire' has performed well in sandy and clay soil types with aggressive growth from its stolons and rhizomes, but it can be mowed with a standard rotary mower due to its broader leaf and open growth habit. It does not do as well in shade as other zoysiagrass cultivars.

'Empire' is being planted in numerous communities in Florida and seems to do well in many areas throughout the state; however, it is susceptible to large (brown) patch disease.

'JaMur'

'JaMur' is a medium coarse-textured cultivar that has performed well in many areas and is now produced in limited quantities in Florida. It has a very attractive color and does well in moderate shade. 'JaMur' has an excellent rate of establishment, performs well at normal home lawn mowing heights, and can easily be mown with a rotary mower. It is susceptible to large (brown) patch disease.

'Meyer'

'Meyer' (Z-52, Amazoy®) has been in use since the 1950s and is often seen in ads as the "miracle grass." It is very slow to establish, and Hunting billbugs and nematodes pose serious problems with 'Meyer', limiting its use in Florida. 'Meyer' zoysiagrass performed very poorly at the Florida locations of the NTEP trial conducted from 1997–2000 (Table 2), and its use in Florida is discouraged.

'PristineFlora™'

'PristineFlora™' is a *Zoysia matrella* cultivar released by the University of Florida. It is recommended for use in high-maintenance situations, including high-end home lawns. This variety is fine textured, extremely dense, and has a dark green color. 'PristineFlora™' does not produce seed heads as prolifically as other fine-textured cultivars, such as 'Emerald' or 'Diamond'. 'PristineFlora™' is similar in appearance and maintenance to 'Diamond'; however, it has a much faster rate of growth and recovers more quickly from scalp damage.

'UltimateFlora™'

'UltimateFlora™' is a *Zoysia japonica* developed by the University of Florida. It has a similar leaf texture and upright growth habit to 'Meyer', but it has a faster rate of spread and better adaptability for use in Florida. This cultivar is used for home lawns and was selected for the lawn at the Birmingham Home & Garden Inspiration Home in Vestavia Hills, Alabama, and at the 2006 New Southern Home in St. Cloud, Florida.

'Zeon'

'Zeon' is a fine-textured *Zoysia matrella* that has performed well in Florida, though its availability is limited in the state.

'Zenith'

'Zenith' zoysiagrass is one of the few commercially available seeded varieties. Generally, the seeded cultivars do not perform as well as the vegetative cultivars (Table 2). 'Zenith' zoysiagrass is dark green and medium textured.

'Zorro'

'Zorro' is a fine-textured *Zoysia matrella* released by Texas A&M University. 'Zorro' establishes well, has good shade tolerance, and is easier to mow than some fine-textured cultivars. This turf performed moderately well in Florida in the 1997–2000 NTEP trial (Table 2).

Table 2. Ranking of average turfgrass quality ratings of commercially available zoysiagrass cultivars grown at two Florida locations from 1997–2000 as part of the National Turfgrass Evaluation Program (NTEP)†

			Turfgrass quality ranking (1 = best)	
Cultivar‡	Establishment method§	Texture£	Gainesville	Pensacola
'El Toro'	Vegetative	Coarse	1	1
'De Anza'	Vegetative	Medium	2	4
'Jamur'	Vegetative	Coarse	3	2
'Zeon'	Vegetative	Fine	4	5
'Emerald'	Vegetative	Fine	5	3
'Zorro'	Vegetative	Fine	6	6
'Meyer'	Vegetative	Coarse	7	8
'Zenith'	Seeded	Coarse	8	7

†Rankings of mean turfgrass quality are achieved by assigning "1" to the highest mean, "2" to the second-highest mean, etc. for each location. Rankings should only be used to determine the general performance of a cultivar at a given location.
‡Only named, commercially available varieties are included in the table. Not all varieties are available in Florida.
§Seeded varieties are direct seeded. Vegetatively established varieties can be established by sod, sprigs, or plugs.
£Textural classes were determined from data taken at the Gainesville location as published by www.ntep.org.

Proper lawn maintenance practices are the best means for avoiding pest problems and maintaining a healthy lawn. Zoysiagrass requires inputs of fertilizer to maintain good cover and healthy growth characteristics. During certain times of the year, it may require supplemental irrigation, especially during periods of extended drought, to remain green. Pesticides may be needed periodically, but their use can be minimized if other cultural practices (mowing, irrigation, fertilization) are done correctly.

Establishment of Zoysiagrass

With one exception, zoysiagrasses must be planted vegetatively by sod, plugs, or sprigs. *Zoysia japonica* is the only species for which seed is commercially available. Proper site preparation before planting is critical to ensure successful establishment. Refer to ENH02, *Preparing to Plant a Florida Lawn* (http://edis.ifas.ufl.edu/lh012), for complete information.

Seeding – Establishing zoysiagrass from seed is increasing in popularity. The seed, however, requires light for germination and cannot be covered with soil, as is normally recommended. Consequently, areas to be established by seed need to be covered with some type of erosion cloth to reduce any surface disruption caused by rain or irrigation. The best time to seed is during the period from April to July, since this permits a full growing season before winter weather. Fall seeding is undesirable because the young seedlings may not become sufficiently established to withstand cold injury during the winter. It may take up to 2–3 weeks to germinate and an additional 6–8 weeks to establish. During this time, irrigation management is extremely important. After seeding, frequent, light irrigations are necessary to keep the soil moist and encourage germination. Maintain this moisture regime until the planted area is completely covered.

Plugging – Because of the slow establishment rate of zoysiagrass (compared to St. Augustinegrass), plugs are usually planted on 8- to 12-inch centers. This means that plugs are planted every 8–12 inches in a row and rows are spaced 8–12 inches apart. The closer spacing provides full coverage more quickly. Depending on the level of maintenance given, at least one full season (and longer for some varieties) is required for complete coverage and a uniform height. Plugs should be tamped firmly into the soil and watered in. During grow-in, the soil should be kept moist until the grass is well rooted. Weeds will dominate the bare areas between the plugs, and they should be scouted on a regular basis and weeds removed before they have a chance to gain hold.

Sprigging – Planting zoysiagrasses by sprigs is a laborious but effective method of establishment. Fresh sprigs with at least 2 or 4 nodes should be planted in rows that are 6 inches apart. Plant the sprigs end-to-end or no more than 6 inches apart in the row, and cover them with soil about 1–2 inches deep, leaving part of each sprig exposed to light. A roller can be used to press sprigs into the soil. Soil must be kept moist until plants initiate new growth and the area is completely covered.

Sodding – Sodding produces an instant turf as the entire area to be planted with grass material is covered. Sodding can also reduce potential weed competition that can occur when using other planting methods that leave bare ground. However, it is important to remember that the grass is still vulnerable at this stage and it is not yet safe for play, traffic, or other activities. It is quite dependent until the roots have developed and extended down into the soil. Sod should only be laid over bare, moist soil, with pieces laid in a staggered brick-like pattern and the edges fitted tightly together to avoid any open cracks (Figure 1). Rolling and watering thoroughly ensures good contact with the soil for fast rooting. Sodded areas should be watered at least twice per day with ¼ inch of water until the sod is held fast to the soil by new roots (usually 2–3 weeks), after which watering should be reduced to an as-needed basis.

Figure 1. Sodding produces an instant lawn.

Maintenance of Zoysiagrass

Nutrient Management

Proper fertilization is very important for sustaining a healthy lawn. Fertilization and other cultural practices influence the overall health and quality of the lawn and reduce its vulnerability to numerous stresses, including weeds, insects, and disease. It is very important that anyone fertilizing their lawn be familiar with and follow the Florida-Friendly Landscaping™ Best Management Practices (BMPs). These practices are designed to maintain