

Zoysiagrass Lawns

Zoysiagrasses (*Zoysia* spp.) are native to the Orient. They provide attractive lawns throughout the United States and perhaps the most beautiful lawngresses in the South. The density and uniformity of zoysiagrass lawns are second to none. However, these turfgrasses require a fairly high level of maintenance to achieve this beauty.

Advantages of Zoysiagrass

Zoysiagrasses are adapted to a wide range of soil and climatic conditions and can be grown throughout the state of Alabama. These turfgrasses have good tolerance to cold temperature, shade, and salt spray. Once established, zoysiagrasses provide extremely dense, slow-growing sod that will reduce weed establishment and competition. Because zoysiagrasses grow slowly, they require less-frequent mowing than other turfgrasses require. Zoysiagrasses can be grown in full sun to partial shade.

Disadvantages of Zoysiagrass

Zoysiagrasses, like all turfgrasses, have their advantages and disadvantages. One characteristic of zoysiagrasses fits both of these categories—its slow growth habit. Due to the fact that zoysiagrasses have such a slow growth rate, they require 2 to 3 years to fully cover a lawn if established from vegetative plugs. As a rule of thumb, zoysiagrasses spread about 6 inches a year. Zoysiagrass also recovers slowly from damage and/or wear due to its slow growth habit.

The improved cultivars of zoysiagrass need to be established by vegetative means; however, there are some research efforts to produce zoysiagrass cultivars that can be established from seed. Several seeded sources of *Zoysia japonica* are being evaluated and may become commercially available in the future.

All zoysiagrasses form a heavy thatch layer over time and require regular maintenance such as dethatching to prevent this from becoming a problem. If thatch accumulation is not managed, the lawn will probably require renovation after a length of time.

Other disadvantages of the zoysiagrasses are high fertility

requirements, the need for frequent irrigation, and possible damage caused by nematodes, billbugs, and diseases. For maximum beauty, mow zoysiagrasses using a reel mower.

Zoysiagrass Varieties

There are several species and cultivars of zoysiagrasses used for home lawns, including Japanese or Korean Lawngress, Meyer zoysiagrass, Matrella zoysiagrass or Manilagrass, Mascarenegrass, Emerald zoysiagrass, Belaire zoysiagrass, El Toro zoysiagrass, and Cashmere zoysiagrass. These species and cultivars vary greatly in their appearance, color, growth rate, and texture.

Japanese or Korean Lawngress (*Zoysia japonica*)

This species of zoysiagrass has a very coarse texture like tall fescue; it is hairy, has a light green color, a relatively faster growth rate than other zoysiagrass species, and excellent cold tolerance. However, this species of zoysiagrass does not make as good a lawn as other improved cultivars and species make.

Although Japanese Lawngress is the only species of

zoysiagrass that can be established from seeds, it is likely to be damaged by the hunting billbug and nematodes. Therefore, this turfgrass is recommended for home lawns where convenience of establishment from seeds is more important than quality.

Meyer Zoysiagrass (*Zoysia japonica* 'Meyer')

Meyer zoysiagrass was tested and developed under the name Z-52 and is sometimes referred to as either Z-52 or Amazoy. Meyer is an improved selection of *Zoysia japonica* and was released in 1951. It has a dark green color, medium leaf texture, and is the most cold tolerant of the zoysiagrasses; however, it is less shade tolerant than Emerald zoysiagrass is. The leaf size is intermediate in width between that of Korean Lawngrass and Emerald zoysiagrass.

Meyer can be established by either plugs, sprigs, or sod and makes an excellent lawn once established. This cultivar of zoysiagrass is the earliest to green up in the spring and the last to go dormant or turn brown in the fall.

Matrella Zoysiagrass or Manilagrass (*Zoysia matrella*)

Manilagrass resembles bermudagrass in color, texture, and quality and is recommended for a high-quality, high-maintenance lawn where a slow rate of establishment is not a disadvantage. This species of zoysiagrass was introduced from China and produces a finer and denser lawn than *Zoysia japonica* cultivars, but it has less cold tolerance. *Zoysia matrella* appears to be highly susceptible to damage caused by nematodes.

A selection of *Zoysia matrella*, tested as FC 13521, was released by the Alabama Agricultural Experiment Station at Auburn University and is now commonly known as Matrella zoysiagrass. Matrella has a finer leaf texture and is more shade tolerant than Meyer zoysiagrass but is less shade tolerant than Emerald zoysiagrass.

Mascarenegrass (*Zoysia tenuifolia*)

This species of zoysiagrass is the finest-textured zoysiagrass available. It has good wear tolerance but develops excessive thatch, giving it a "puffy" appearance. It also is the least cold-tolerant zoysiagrass; therefore, it is best adapted to the central and southern areas of the state.

Emerald Zoysiagrass

Emerald zoysiagrass is a hybrid between *Zoysia japonica* and *Zoysia tenuifolia* and was released in 1955. This hybrid zoysiagrass combines the cold tolerance, color, and faster growth rate of one parent with the fine texture and density of the other parent. Emerald zoysiagrass resembles *Zoysia matrella* in color, density, and texture but grows faster and has a wider adaptation. Emerald zoysiagrass characteristics include very fine leaf texture, good cold tolerance, good shade tolerance, good wear resistance, and dark green color, but it lacks the cold tolerance of Meyer zoysiagrass. Emerald zoysiagrass is highly recommended for high-quality lawns where time and money allow for an adequate maintenance program. Emerald may be the most beautiful of the zoysiagrasses, but it also is subject to thatch accumulation and "puffiness" and is susceptible to brown patch, dollar spot, and leaf spot diseases.

Belaire Zoysiagrass

Belaire is an improved selection of *Zoysia japonica* developed in Maryland and released by the USDA in 1985. It is noted for its excellent cold tolerance and medium green color. Belaire has an open growth habit, and it has a coarser leaf texture and faster growth rate than Meyer zoysiagrass has. This cultivar is susceptible to brown patch disease.

El Toro Zoysiagrass

El Toro zoysiagrass is an improved selection of *Zoysia japonica* released in 1986 from California. It resembles Meyer zoysiagrass in appearance but has a faster growth rate, improved color in cooler temperatures, and less thatch accumulation. El Toro also has early spring greenup like Meyer zoysiagrass and has been reported to have improved resistance to the rust diseases.

Cashmere Zoysiagrass

Pursley Turf in Florida released Cashmere zoysiagrass in 1988. This cultivar of zoysiagrass resembles Emerald zoysiagrass in color, density, and leaf texture, but it does not exhibit the stiff, bristlelike feel of Emerald. The degree of cold tolerance and shade tolerance is not fully known; therefore, it is recommended that Cashmere be grown in the central and southern areas of the state. Pursley Turf recommends that this cultivar be grown in soil containing clay, shell, rock, marl, or sand.

Establishing Zoysiagrasses

Zoysiagrasses are primarily established by vegetative propagation, with the exception of *Zoysia japonica*, which can be established from seeds. Successful establishment is highly dependent on the proper preparation of the soil and seedbed. Remove all construction debris, rocks, stumps, brush, and other undesired vegetation before grading the lawn site. If necessary, remove the lower limbs of trees to allow better sunlight penetration and make soil preparation and future mowing easier. Ensure that the lawn slopes away from the house for better drainage. After establishing the final grade, take soil samples to determine the soil pH and fertility levels. The soil test results will provide the information needed to determine how much lime and/or fertilizer will be needed.

Vegetative propagation is simply the transplanting of large or small pieces of the turfgrass. The three basic methods of vegetative propagation or planting of the zoysiagrasses are sodding, plugging, and sprigging. The best time of the year to establish or plant zoysiagrasses is from April to July.

Sodding

The establishment of zoysiagrasses by sodding is a common method and produces the so-called “instant” lawn. Sodding is recommended where immediate ground cover is needed and expense

is not a concern. Sod areas that are severely sloped to prevent soil erosion. Lay the sod horizontally across the sloped areas, and alternate the seams of the sod like bricks to ensure stability. For best results, ensure that the zoysiagrass sod is of good quality, free of weeds, watered immediately after installation, and rolled to provide a uniform lawn. Water the newly installed sod until the turfgrass has become rooted into the soil and established.

Plugging

Plugging is the most common method of zoysiagrass establishment. Rectangular or circular plugs of zoysiagrass are cut from sod and placed into holes of the same size. Because of the slow growth rate of zoysiagrasses, the plugs are usually planted on 6- to 8-inch centers. This means that plugs are planted every 6 inches in a row and the rows are spaced 6 inches apart. The distance between plugs can vary; however, even with 6-inch spacing, it will take at least 1 year for the lawn to “grow in” and have complete coverage. If 2-inch-square plugs are planted on 6-inch centers, about 100 to 150 square feet of zoysiagrass sod will be needed for every 1,000 square feet of lawn area to be planted. Plugs must be in firm contact with the soil to ensure their survival. This can be accomplished by tamping the plugs or stepping on them. Keep the soil moist until the turfgrass has become well rooted in the soil.

Sprigging

The planting of zoysiagrasses by sprigs is a laborious method of establishment if done by hand. Sprigging machines exist but may not be available. The most likely sources of mechanical spriggers are rental stores, landscape contractors, and sod producers.

Plant fresh, vigorously growing sprigs (runners) that have at least two to four nodes (joints) in rows that are 6 inches apart. Plant the sprigs no more than 6 inches apart in the row, and cover them to a depth of 1 to 2 inches, leaving a portion of each sprig exposed above the ground. This will require between 8 to 15 square feet of zoysiagrass sod per 1,000 square feet area of lawn to be sprigged or 5 to 10 bushels of sprigs if available.

Sprigs can be broadcast-applied to the soil surface by hand shaking and then “cut” in using a small disc harrow to place the sprigs in a furrow. Apply a light topdressing of soil and/or sand over the sprigs to ensure good soil contact. A roller can also be used to press the sprigs into the soil to ensure good soil contact. After sprigging, roll and water the lawn as recommended for plugging. Be sure to keep the soil moist until the turfgrass sprigs have

initiated new growth and the lawn is completely covered.

Maintaining Zoysiagrasses

For the first 2 weeks after establishment, water the zoysiagrass lightly every day in the absence of rainfall to ensure the survival of the turfgrass plants. After the first 2 weeks, the frequency of watering can be reduced. It is recommended to water less frequently but apply more water at one time to saturate the soil to promote deeper rooting of the newly established turfgrass.

Fertilizing

To look their best, zoysiagrasses require frequent fertilization. Periodic soil testing should be conducted every 2 to 3 years as the basis for major applications of lime and fertilization. This will help maintain the proper soil pH between the desired range of 6.0 to 6.5 and keep the nitrogen, phosphorous, and potassium levels at recommended levels.

For minimum maintenance, it is recommended to apply between 2 to 4 pounds of actual nitrogen per 1,000 square feet of zoysiagrass lawn per year. To accomplish this, apply a complete fertilizer such as 16-4-8, 13-13-13, or

10-10-10 at least three times a year in April, June, and August (see Table 1). Potassium helps turfgrasses survive stress. Zoysiagrasses growing on sandy soils may need 1 pound of potassium per 1,000 square feet of lawn area per year. September is a good time to apply potassium to improve winter survival and cold tolerance. A fertilizer such as a 16-0-44, 15-0-15, 10-20-20, or 0-24-24 can be used for this fall application of potassium.

To produce a high-quality, dark green zoysiagrass lawn, it is recommended to apply between 6 to 8 pounds of actual nitrogen per 1,000 square feet of zoysiagrass lawn per year. Apply a complete fertilizer such as 16-4-8, 13-13-13, or 10-10-10 once a month starting in April through September. As with the minimum maintenance program, apply potassium in the fall to improve the winter survival and cold tolerance of zoysiagrasses.

Mowing

If zoysiagrasses are fertilized as recommended, they will require frequent mowing (probably weekly) during the optimum growing months of the summer to look their best. Zoysiagrasses provide their best appearance and quality when mowed to between $\frac{1}{2}$

Table 1. Suggested Fertilization Schedule for Zoysiagrass Lawns

Desired Quality	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum Maintenance				C ¹				C	K ²			
Highest Quality				C ¹	C	C	C	C	C, K ²			

¹Complete fertilizer (C) applied at 1 pound of nitrogen pr 1,000 square feet

²Potassium-containing fertilizer (K) applied at 1 pound of potassium per 1,000 square feet

Table 2. Optimum Mowing Heights and Mowing Frequency of Zoysiagrass Species and Cultivars

Zoysiagrass Species or Cultivar	Mowing Height (inches)			Mowing Frequency (days)
	Minimum	Optimum	Maximum	
<i>Zoysia japonica</i>	2	2	3	7–10
Meyer zoysiagrass	1	1½	2	10–14
Matrella zoysiagrass	½	1	1	10–14
<i>Zoysia tenuifolia</i>	½	¾	1	10–14
Emerald zoysiagrass	½	1	1	10–14
Belaire zoysiagrass	1	1½	2	7–10
El Toro zoysiagrass	1	1½	2	7–10
Cashmere zoysiagrass	½	¾	1	10–14

and 1 inch in height (Table 2). A reel mower is recommended for the highest-quality appearance. Clippings do not need to be collected if the fertilization schedule is less than 4 pounds of nitrogen per 1,000 square feet of lawn per year. If the fertilization rate exceeds 4 pounds of nitrogen per 1,000 square feet of lawn per year, collect the clippings to reduce the potential for thatch accumulation.

Watering or Irrigating

Zoysiagrasses require watering or irrigating, especially if parasitized by nematodes, which greatly restrict the root system. During prolonged droughts, it may be necessary to water or irrigate zoysiagrasses every other day during the summer months. Irrigation on an as-needed basis is an excellent way to schedule watering of any turfgrass, as long as the proper amount of water is applied when needed, not at a later or more convenient time. When using this approach, water at the first sign of drought stress or wilt, and apply at least ¾ inch of water (465 gallons of water per 1,000 square feet) per irrigation. Water or irrigate early in the morning while dew is still on the turfgrass plants.

Controlling Thatch

Zoysiagrasses typically develop a layer of organic material called thatch between the green leaves of the turfgrass and the soil surface. Thatch accumulates over time if not controlled and can harbor insects and disease-causing organisms. If thatch is allowed to accumulate to a thickness greater than ¾ inch, it can also create a barrier to air and water movement and raise the living turfgrass plant away from the soil. Check the thickness of the thatch layer in September or October by cutting a small triangle or square in the turfgrass, using a knife or shovel. Remove this “plug,” and look at the soil under the green turfgrass plants. The thatch layer will be brown to black in color and have a different appearance from the native soil beneath. If the thatch layer exceeds ¾ inch in thickness, you need to mechanically dethatch the lawn in the spring, anytime from April through August. However, you should not dethatch until the turfgrass has completed greenup after winter dormancy and begun to initiate good spring growth. You can use core aerifiers, aerators, vertical mowers, power rakes, or spring attachments for mowers to remove thatch. Apply a light application of lime (10 pounds per 1,000 square feet) after dethatching to help the remaining thatch decay. You can control thatch by using routine core aeration followed by a light top-dressing of soil and/or sand.

Controlling Pests

Several insects, diseases, and nematodes trouble zoysiagrasses. You will have to control one or more of these pests periodically in order to grow a high-quality zoysiagrass lawn.

Insect Pests

The most serious insect pest on zoysiagrasses is the hunting billbug. Billbugs destroy and feed on the roots, and subsequently, the zoysiagrass plants die in irregular patches. You may have periodically use an insecticide labeled for billbug control. Lawn caterpillars may also damage zoysiagrasses.

Disease Pests

Disease problems of zoysiagrasses include brown patch, dollar spot, and rust. Proper fertilization and watering normally suppress these disease pests.

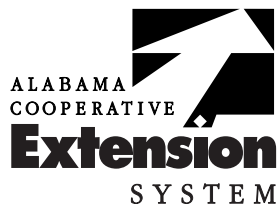
Nematode Pests

Probably the most serious pests on zoysiagrasses are nematodes. These microscopic, soilborne "worms" attack the roots of the zoysiagrass plants and if not controlled can completely kill the entire zoysiagrass lawn. Once nematodes have been identified as a serious problem, you have several options for treating them—ignore the problem, change the maintenance practices and hope to live with the problem, remove the existing turfgrass, or treat the lawn with a nematicide.

Weed Pests

Properly maintained zoysiagrasses typically do not have many weeds because the turfgrass is so dense and naturally prevents weeds from establishing. However, if the zoysiagrass has become thin or injured from excessive traffic or wear, crabgrass and other weeds may become established. Apply preemergence herbicides in the early spring (February and March) before crabgrass and other annual weeds germinate. Apply these herbicides after any dethatching operations to ensure their effectiveness. Always read and follow the label directions of herbicides before applying them.

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