Zoysiagrass

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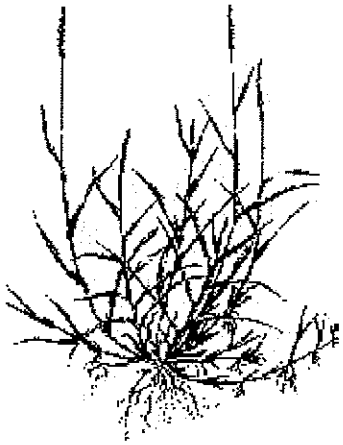
Distribution and Origin. Zoysiagrasses are warm season grasses native to China, Japan and other parts of Southeast Asia. The species was named to commemorate an 18th century Austrian botanist, Karl von Zois. In 1911, Zoysia matrella was introduced into the United States from Manila by a U.S.D.A. botanist, C. V. Piper. Because of its origin the grass was commonly called Manila grass.

Piper described the grass as abundant on or near the seashore in the Philippine Islands. When closely clipped, it made a beautiful lawn according to Piper's notes. He suggested that the grass had unusual promise as a lawn grass along the Gulf Coast and Atlantic coast of Florida.

Zoysia japonica, sometimes called "Japanese lawn grass" or "Korean lawn grass", is a coarser textured, but more cold hardy species than *Zoysia matrella*. *Zoysia japonica* was introduced into the United States in 1895 from the Manchurian Province of China. In the United States, *Zoysia japonica* could be expected to do very well as far north as Maryland. It is a seeded variety of Zoysia.

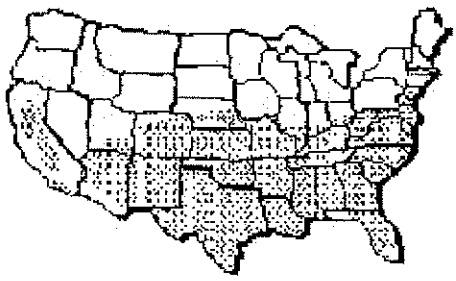
The third species of Zoysia used for turf is called Korean velvet grass or Mascarene grass, *Zoysia tenuifolia*. It is a very fine textured species, but is the least cold tolerant of the three species. *Zoysia tenuifolia* is native to the Far East and was introduced in the U.S. from the Mascarene Islands. In the U.S. it is used in southern California as a low growing ground cover.



Description. Zoysiagrasses are sod-forming perennial species that possess both stolons and rhizomes. The grasses turn brown after the first hard frost and are among the first warm season grasses to green up in the spring. The species vary from extremely fine textured to coarse textured types and the leaf blades are very stiff due to a high silica content.

Leaves are rolled in the bud shoot. Leaf blades are smooth with occasional hairs near the base, margins are smooth and blades are sharply pointed. Ligule is a fringe of hairs. Auricles are absent. Leaf sheath is round to slightly flattened, split, glabrous, but with a tuft of hair at the throat. Inflorescence is a short, terminal spikelike raceme with spikelets on short appressed pedicels.

Adaptation and Use. A highly versatile species, zoysiagrasses make ideal lawn grasses in some situations and can be used on golf courses, parks and athletic fields. They can be grown in all kinds of soils ranging from sands to clays and both acid and alkaline in reaction. In the U.S., zoysiagrasses are adapted along the Atlantic coast from Florida to Connecticut and along the Gulf Coast to Texas. They are also adapted throughout the transition zone of the U.S. and in California.



In the southern U.S., the zoysiagrasses grow well in moderately shaded locations. In cooler climates, zoysiagrass does not perform as well under shade as some other species.

Zoysiagrass is extremely drought tolerant. Although it does turn straw colored under severe drought conditions, it has the capacity to respond to subsequent irrigation or rainfall. Its water requirements are similar to those of bermudagrass. The leaf blades of zoysiagrass are among the first to roll under drought conditions, thus it tends to conserve moisture more effectively than other species. Zoysiagrass also has a deep root system allowing it to more effectively extract water from greater soil depths.

Zoysiagrass is nearly as salt tolerant as bermudagrass. It is widely grown along sandy seashores where drainage is adequate. Zoysiagrass does not tolerate poorly drained soils whether they are saline or otherwise.

Zoysiagrasses are among the most wear tolerant turfgrasses. However, their slow rate of growth gives them very poor recuperative potential. Therefore, they perform satisfactorily on lawns, golf course fairways and baseball fields. But, they are not recommended for football or soccer fields where traffic is concentrated in certain areas of the field. If the grass is completely worn in those areas, zoysiagrass is very slow to fill in the damaged areas.

Varieties. There are three principal species of zoysiagrass used for turf: *Zoysia japonica*, *Zoysia matrella*, and *Zoysia tenuifolia*. These species are differentiated by texture, cold tolerance and aggressiveness.

Zoysia japonica, often called Korean or Japanese lawngrass, was introduced into the U.S. in 1895. *Zoysia japonica* is more cold tolerant than the other species, but is also the most coarse textured of the three species. *Zoysia japonica* is the only zoysiagrass species that can be established from seed.

Meyer zoysiagrass is an improved strain of *Zoysia japonica*. It was selected from a population of plants grown from seed by the U.S.D.A. in 1941. It was evaluated by the U.S.D.A., U.S.G.A., and state universities and released jointly by the U.S.D.A. and U.S.G.A. in 1951. The selection was named in honor of Frank N. Meyer, a plant explorer for the U.S.D.A. who made the first collection of zoysiagrass seed in Korea in 1905.

Meyer was selected primarily for its texture, color, and vigor compared to other zoysiagrass selections. Meyer is slow to become established and must be propagated by sod or sprigs. Once established it develops a very dense turf, demonstrates good cold tolerant and grows well in partial shade. Meyer is best adapted to the transition zone where summers are too hot and humid for cool season grasses and winters too cold for bermudagrass.

Belair and El Toro are new releases of *Zoysia japonica* from U.S.D.A. and the University of California, respectively. Both are coarser textured, but faster spreading varieties than Meyer.

Zoysia matrella was introduced into the U.S. in 1911 from Manilla. It is chiefly a tropical and subtropical grass, but can be grown as far north as Connecticut in the U.S. *Zoysia matrella* grows well in moderate shade and forms a thick mat in full sun. The leaf blades of *Zoysia matrella* are narrow, sharply pointed and wiry. In tropical climates the grass remains green year around. But, in cooler climates it turns brown after several hard frosts and remains brown until late spring. *Zoysia matrella* must be propagated from sprigs and is quite slow to become established.

Zoysia tenuifolia is the finest textured, least winter hardy of the zoysiagrasses. It has very fine, short, wiry leaf blades and forms a dense, fluffy turf. It is extremely slow to spread and is most often used as a ground cover.

Emerald zoysiagrass is a hybrid between *Zoysia japonica* and *Zoysia tenuifolia* released by the U.S.D.A. and the Georgia Agricultural Experiment Station in 1955. Emerald combines the fine texture of *Zoysia tenuifolia* with the cold tolerance and faster rate of spread of *Zoysia japonica*. Emerald is similar to *Zoysia matrella* in appearance and habit.

Zoysiagrasses can be established from seed, sprigs or sod. *Zoysia japonica* is the only species that can be established from seed.

Meyer and Emerald zoysiagrass, Manila grass and *Zoysia tenuifolia* must be propagated vegetatively from sprigs, plugs or sod. The slow rate of spread of zoysiagrass makes seedbed preparation and planting techniques very important to successful establishment of a zoysia turf.

The seedbed should be finely pulverized, smooth, firm, and weed-free prior to planting. Zoysiagrass sod may be shredded or torn apart to provide sprigs or it may be cut into 2-inch sod plugs for planting. A sprig should consist of a section of stem or rhizome with 2 or more nodes. Leaves do not need to be present.

Sprigs should be planted no more than 2 inches apart in rows spaced 6 inches apart, or broadcast over an area at a rate of 10 bushels per 1,000 sq. ft. If planted in rows it is important that the sprigs not be completely covered with soil. At least one node should be above soil level. If sprigs are broadcast over the surface, they should be rolled to insure good soil contact. Freshly sprigged zoysiagrass must be kept moist for several weeks after planting. And, special attention should be given to weed control since zoysigrass is much less aggressive than bermudagrass and some of the common turf weeds.

A newly planted zoysiagrass turf should be fertilized with a 1-2-1 or similar fertilizer at a rate of 1 pound of nitrogen per 1,000 sq. ft. of area at the time of planting. Monthly applications of nitrogen at ° to 1 pound per 1,000 sq. ft. will promote the spread of zoysiagrass.

Sprigging is the least expensive method of planting zoysiagrass and usually gives a faster rate of cover than plugging. However, keeping the soil moist during the establishment period is most critical with sprigs. Small plantings of zoysiagrass sprigs can be covered with a clear polyethylene tarp to maintain adequate moisture and increase soil temperature in the early spring. The cover can be left in place for several weeks, or until temperatures get too hot. The plastic cover can increase the rate of spread of zoysiagrass and reduce the time required to obtain a complete cover. The best time for planting zoysiagrass is late spring and early summer.

Zoysiagrasses grow from early spring through late fall when moisture and nutrient requirements are met. Although zoysiagrass is considered to be a drought tolerant species, it ceases growth and begins to discolor during extended dry periods. To maintain growth zoysiagrass requires 1 to 1° inches of water per week during mid-summer, although it can survive on less than 1 inch of water per week. Water should be applied 2 to 3 times per week depending on temperatures and soil conditions. Sandy soils require more frequent irrigations than heavier clay soils; and, as temperatures increase, irrigation frequency must increase. During prolonged droughts when it is impractical to water enough to

maintain growth, weekly applications of as little as 0.5 inch of water are adequate to keep the grass alive.

During dry winter months, zoysiagrass requires occasional irrigation to prevent desiccation and serious loss of stand even through the grass may be dormant.

Zoysigrass requires a moderate level of nitrogen fertilizer to maintain a dense turf. In lawn situations, 2 or 3 applications of nitrogen during the growing season will maintain turf density and color. Each application should provide about 1 pound of nitrogen per 1,000 sq. ft. of area. Applications should be made in late spring, early summer, and fall. In areas where zoysiagrass remains green year around, frequent applications of soluble nitrogen fertilizers will help maintain a green color during the cool season (usually pound of soluble nitrogen per 1,000 sq. ft. per month from October through March will suffice). Where zoysiagrass goes dormant during the winter, discontinue fertilization until spring.

Close, frequent mowing produces the finest zoysiagrass turf. But, most people compromise some quality for less frequent mowing. On golf courses and athletic fields, zoysiagrass should be mowed at a ° to 1 inch height every 3 to 5 days. On lawns growing in full sun, zoysiagrass may be mowed at a height of 1 to 2 inches every 5 to 7 days. Less frequent mowing at these recommended heights results in scalping and generally poor quality turf.

In shaded sites, zoysiagrass should be mowed slightly higher than recommended for lawns in full sun. Mowing frequency should not change for shaded sites even though the mowing height is slightly increased.

Zoysiagrass lawns tend to build up a thatch layer, a layer of undecomposed organic residues just above the soil surface. Proper mowing is essential to prevent the accumulation of thatch in zoysiagrass turf. Frequent mowing at recommended heights and clipping removal help prevent thatch accumulation. Avoiding excessive applications of nitrogen fertilizer also helps prevent thatch accumulation.

Occasionally, thatch removal by mechanical means is required to prevent serious deterioration of zoysiagrass turf. Vertical mowers or flail mowers may be used to remove excess thatch from zoysiagrass turf. Thatch removal should be done well before fall to allow ample time for regrowth. Scalping the lawn in early spring to remove accumulated growth will also help prevent thatch accumulation.

Zoysiagrasses are relatively free of serious pest problems. Brownpatch, rust and leaf spot diseases can cause problems in zoysiagrass turf, but the grass usually recovers when environmental conditions change. In intensively maintained lawns, fungicides may be needed to prevent these diseases. In the fall, applications of Banner, Daconil or Bayleton are required to prevent rust on zoysia lawns.

White grubs are the major insect attacking zoysiagrass turf. Monitoring the soil underlying the turf during summer and fall is the most effective way of preventing a grub problem. When populations of grubs exceed 4 to 5 per square foot of turf, treatment with insecticides is recommended.

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