

## PLANTING AND CARE OF A ZOYSIAGRASS LAWN



University of Maryland  
Turfgrass Technical Update  
TT - 69 July 2003

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Zoysiagrass was introduced into the U.S. from Asia before 1895. It was not until the 1950s, however, that it began to be used on home lawns. Although advertising has stimulated a great deal of interest in the planting of zoysiagrass nation-wide, it is only well adapted to transition zone regions, which includes non-mountainous areas of Maryland, Virginia, Delaware and Washington, D.C.

Zoysiagrass has excellent summer and winter hardiness, but it is slow to establish, and it has a straw-brown color during winter. Zoysiagrass does not tolerate shade and should be planted in sunny areas. Before deciding to plant, carefully weigh the advantages and disadvantages of zoysiagrass (Tables 1 & 2).



Zoysiagrass makes an excellent lawn grass because it requires little water, fertilizer and pesticides, and because it is relatively slow growing and therefore doesn't require frequent mowing. Zoysiagrass should not be planted in shady areas or in situations where it will get a lot of traffic (i.e., athletic fields). Its tan or straw-brown color during winter, however, may be considered objectionable. In Maryland, zoysiagrass enters the tan, winter-dormant state in mid-October and remains dormant until mid-May.

The first step in planning a zoysiagrass lawn is to choose a cultivar. Depending on the cultivar, zoysiagrass is established either by vegetative means (i.e., sprigs, plugs or sod) or by seed. Although seeded cultivars of zoysiagrass are available, the seed is expensive and may have low germination rates.

'Meyer' is the preferred vegetatively propagated cultivar in most areas of the northern U.S. because of its excellent winter hardiness. 'Matrella' and 'Emerald' provide a more aesthetic cover than Meyer; however, they are not recommended for use in Maryland because they are less winter hardy than Meyer.

Cavalier, Marquis and Sunburst are newer vegetatively propagated zoysiagrass recommended for use in Maryland. Common Korean (a seeded cultivar) is a winter-hardy, aggressive cultivar, but it is coarsely textured and very susceptible to rust disease.

In addition, common Korean provides a lower level of quality when compared to Meyer. New and improved seeded cultivars also are available. Seeded cultivars (e.g., 'J-14', 'J-36', 'J-37', 'Zen 400', 'Zen 500', 'Zenith') are finer textured than common Korean and possess greater aesthetic quality. The seeded cultivars have not received widespread testing or use in Maryland; Meyer continues to be the most popular cultivar.

### KEY POINTS

Zoysiagrass thrives in many sunny regions of the 'transition zone', including most of Maryland.

Zoysiagrass can be established by seeds, sprigs, plugs, or sod; the best time to establish zoysiagrass is after spring green-up.

It is important to irrigate immediately after planting zoysiagrass.

Zoysiagrass has excellent drought, heat and wear tolerance.

Zoysiagrass has poor shade tolerance.

As noted above, zoysiagrass may be established from seed, sprigs, plugs or sod. Vegetative propagation, however, is the only method of establishment for Meyer, Cavalier, Marquis and Sunburst. Sprigs, also called stolons or runners, are above-ground stems; plugs include leaves, stems and roots encased in a soil plug. Sprigs establish more rapidly than plugs, but they require much more planting effort and care. Sprigs should be planted in a tilled soil-bed with either a specialized planter or, more painstakingly, by hand. For homeowners, plugs are preferred because they are easier to handle and do not dry-out as fast as sprigs. Sod can be established quickly, but it is very expensive. Soil should be amended with fertilizer and lime according to soil test recommendations prior to planting. Unlike sprigs, plugs can be planted into an existing lawn. However, because zoysiagrass does not compete well with other lawn grasses or weeds, it may never fill-in properly. Therefore, all existing vegetation should be eliminated prior to plugging into an existing lawn with the non-selective herbicide called Round-up Pro (common chemical name: glyphosate). Despite a pre-plant application of Round-up Pro, plugged zoysiagrass normally requires at least two growing seasons before it becomes fully established.

The best time to plant zoysiagrass is following spring green-up, which in Maryland is generally late May. Plugs should be planted on 6 to 12 inch centers; the closer the plug spacing the more rapid the establishment. A steel plugging tool is used to create a cylindrical or square hole for the plugs. Plugs should fit tightly into holes and be pressed flush with the soil surface to provide good soil contact. Do not cover plugs with soil. The following spring, however, a soil topdressing may be needed if plugs are elevated above the soil surface or if soil has eroded from around plugs.

Sprigs and seed should only be planted on bare, firm, and evenly graded soil. Apply seed at a rate of 1.0 pound per 1000ft<sup>2</sup>. Lightly rake seed into the top 0.25 inch of soil and roll the seedbed to ensure adequate seed to soil contact. For sprigging, individual sprigs should be 3" long and contain 1 or 2 nodes (i.e., swollen, knot-like tissue of stems). At least one node should be planted 0.25 to 0.50 inch below ground. A garden hoe or shovel is used to create a groove into which sprigs are planted. Once in the groove, step on the sprig to ensure good soil contact. Sprigs should be spaced 4 to 12 inches apart with a row spacing of 6 to 12 inches. Custom-made sprigging machines can be used to speed the planting of sprigs. However, there are few such machines available.

Regardless of planting method, the area must be irrigated immediately. Thereafter, plugs should be watered daily for 7 to 10 days. Sprigs and seedlings, however, may have to be watered several times daily for several weeks after plants begin to produce roots to prevent drying-out. Frequent nitrogen fertilization the year Meyer plugs and sprigs are planted will reduce spread of stolons. Therefore, it is recommended to avoid nitrogen fertilizer applications for one month following planting. Except for the initial, soil incorporation of fertilizer, apply no more than 1.0 lb to 2.0 lb of nitrogen per 1000ft<sup>2</sup> to newly planted zoysiagrass during the first growing season. The single, post plant fertilization of zoysiagrass should be performed prior to mid-August. Begin to mow once seedlings, sprigs or plugs are rooted into soil and cannot be disturbed by the mower. Zoysiagrass should be maintained between 0.5 and 1.5 inch mowing height. Mowing higher will encourage thatch and reduce the aesthetic quality of the turf.

During the second summer, water soluble nitrogen fertilizers such as urea may be used more liberally to hasten zoysiagrass cover. Apply nitrogen in the second year on monthly intervals during mid-May, June, July and August. Do not exceed more than 1.0 lb of nitrogen per 1000ft<sup>2</sup> per application; don't apply more than 4.0 lb of nitrogen per 1000ft<sup>2</sup> during the second summer of establishment. Water all fertilizer into soil after application and irrigate the zoysiagrass thereafter on an as-needed basis to prevent drought stress. In subsequent years (assuming the turf has good density, vigor and acceptable color), do not exceed more than 2.0 lb of nitrogen per 1000ft<sup>2</sup> per year. Use of slow release nitrogen fertilizers such as sulfur coated urea, IBDU, ureaformaldehyde (UF), or natural organics (e.g., Sustane, Ringer Lawn Restore, etc.) may help to slow thatch production in established zoysiagrass turf.

It is likely that annual grass weed control will not be necessary once a dense stand of zoysiagrass has been achieved. Annual grass weed control, however, is essential during the first two growing seasons. If plugging or sprigging apply the herbicide Ronstar (oxadiazon) following planting to preemergently control crabgrass, goosegrass and other annual grass weeds. Tupersan (siduron) may be used safely when establishing common Korean seedlings to reduce summer annual grass weed competition, but its safety on new and improved zoysiagrass cultivars is unknown. The postemergence herbicide Acclaim Extra (fenoxaprop-ethyl) may be used over top of rooted plugs to control annual grasses after they have emerged. Sprigs and seedlings, however, will not tolerate postemergence herbicides the first year. Mow sprigged and seeded areas frequently to reduce weed competition. It is important to note that zoysiagrass management is much different than that of Kentucky bluegrass or fescue lawns. The key steps in successful management of an established zoysiagrass lawn are as follows.

## **Fertilizer & Limestone**

Mature zoysiagrass lawns require only 1 or 2 fertilizations per year. Apply fertilizer at spring green-up (usually May) at a rate of 1.0 lb of nitrogen per 1000ft<sup>2</sup>. A second application of nitrogen fertilizer only should be applied if color and vigor are poor. Slow release nitrogen fertilizers such as sulfur coated urea, IBDU, UF, methylene urea and natural organics are preferred on established stands as their use may result in less thatch accumulation. To reduce potential winter injury, avoid applying any nitrogen after August 15. In most soils, phosphorus fertilizer need only be applied every 2 to 3 years. Potassium should be applied annually at 1.0 to 2.0 lb of potassium per 1000ft<sup>2</sup>. Limestone should be applied if a soil test indicates a pH below 5.5. If soil pH is below 5.5, then apply 25 to 50 lb of lime per 1000ft<sup>2</sup> each autumn until pH rises above 6.0.

## **Mowing**

Zoysiagrass is a slow growing grass and generally requires mowing on 10 to 14 day intervals during the growing season. Zoysiagrass grows more rapidly in hot and moist weather, and may require weekly mowing during summer. Zoysiagrass should be mowed at 0.5 to 1.5 inch height. A reel mower is best suited for low mowing of zoysiagrass and provides a more attractive appearance. Mowing with rotary mowers does a good job, but the mower blade should be sharpened several times each summer. Mowing zoysiagrass above a two-inch height causes it to develop a dense mat, which contributes to a harmful thatch build-up. The last autumn mowing should be to a height of 1.5 inches. The following spring, it is helpful to lower the mowing height abruptly to 0.75 to 1.0 inches. This helps to remove the dead, over-wintering foliage and speed the spring green-up process. Once at 100% green-up, maintain your normal, desired height of cut.

## **Watering**

Zoysiagrass tolerates heat and drought stress better than most other lawn grasses. During droughty periods, zoysiagrass may wilt and develop a blue-gray or gray-green color. At the first sign of a color change, the lawn should be watered to a soil depth of 4 to 6 inches or deeper. It is best to water zoysiagrass when it begins to wilt rather than on a timed schedule or interval. Newly planted zoysiagrass lawns, however, should be kept moist daily during the first 2 to 3 weeks to prevent harmful desiccation of sprigs, plugs or seedlings.

## **Weed Control**

After a zoysiagrass lawn is well established, it normally has little need for weed control. The most common weeds in zoysiagrass turf are wild onion and garlic, dandelions, white clover, and winter annuals such as henbit and chickweed. Several of these weeds are difficult to control, but a combination of 2,4-D plus either dicamba, dichlorprop, MCPP, or triclopyr plus clopyralid will reduce their invasiveness. Avoid using dicamba under trees or shrubs, especially in sandy soils. Crabgrass and other annual grass weeds are best controlled preemergently with an early April application of Barricade, Dimension, Lesco Pre-M, Pendulum, Ronstar, Team or similar-type herbicide. Summer annual grass weeds can be postemergently controlled with Acclaim Extra, DSMA or MSMA. For more information on herbicides and weed control consult TT-77 and 85.

## **Insect & Disease Control**

Chinch bugs, bill bugs and sod webworms may cause damage to zoysiagrass from June to September. A May or June application of an appropriate insecticide should be considered if insects damaged the lawn during the previous year. Otherwise, use an insecticide curatively as soon as insect injury is observed.

Dollar spot, large patch and rust are the most common zoysiagrass diseases. Dollar spot and large patch are potentially more severe than the other diseases, but rust is more common and can be debilitating and may delay spring green-up. Dollar spot and rust can be controlled with Bayleton, Banner MAXX or similar fungicides. Where large patch is a chronic problem, it should be treated preventively in the autumn before zoysia enters dormancy with either Chipco 26GT, Compass, Heritage, Insignia, ProStar, or Terraclor (PCNB). Large patch is common on Meyer zoysiagrass grown on golf courses, but seldom appears on lawns. Seeded cultivars, however, are more susceptible to large patch than Meyer. Zoysiagrass lawns that show signs of poor vigor in summer should be monitored for plant parasitic nematode populations. Nematicides are not available for use on home lawns, but nematode injury can be reduced by employment of sound cultural practices, such as increasing mowing height, watering deeply but infrequently, and use of a complete (i.e., N + P + K) fertilizer at spring green-up.

## Thatch Control

Thatch refers to the accumulation of living and dead stem and root tissues of turfgrass plants that lies above the soil surface in a distinctive layer. Thatch build-up reduces the stress tolerance of turf, impedes the downward movement of water into soil, harbors insect pests and pathogens and generally contributes to a decline in turf health. Applying excessive amounts of nitrogen fertilizer and mowing zoysiagrass high greatly contributes to thatch development.

When thatch exceeds 1 inch in depth it should be removed with a machine called a verticutter or powerrake in early summer. Annual core aerification, followed by crushing and dragging of soil cores across the lawn, is the best way to reduce thatch. Close mowing in early spring also helps to control thatch. To be most effective, power raking, core aerification and close mowing, in spring should be done before a significant thatch layer (i.e., over 1 inch) develops. Occasional burning of the brown leaves of zoysiagrass in early spring may help to reduce thatch, but this practice is extremely hazardous and in most areas unlawful.

**Table 1. Desirable Characteristics of Properly Maintained Zoysiagrass**

1. Excellent heat and drought tolerance
2. Provides a dense, cushiony turf
3. Requires less water or fertilizer when compared to other turfgrasses
4. Dense stands are generally free of serious pest problems
5. Excellent wear tolerance
6. Can be mowed low (0.5 - 1.5 inches)
7. Generally requires less mowing due to a relatively slow growth rate when compared to other turfgrass species

**Table 2. Undesirable Characteristics of Zoysiagrass**

1. The attractive green color of summer becomes straw-brown in mid-October and remains dormant until mid-May
2. Require 2 to 3 years to become well established
3. Many cultivars, including Meyer, must be established through vegetative means with either stolons, plugs or sod; seed may be cost prohibitive
4. Despite excellent wear tolerance, recuperation from injury is slow
5. Intense traffic or sporting events during the dormancy period will cause extensive injury and loss of density
6. Zoysiagrass grows poorly in shade
7. Winter annual weeds and wild onion or garlic give stands an undesirable appearance during the dormancy period
8. Over-fertilized zoysiagrass turfs are prone to the development of a dense thatch
9. Zoysiagrass encroaching into flower beds may be difficult to control
10. Ice cover in low, wet and shaded environments can kill or severely reduce stand density

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