



Better Turf for Better Golf

# TURF MANAGEMENT

from the USGA Green Section

## Emerald Zoysia—An Improved Hybrid Lawn Grass for the South<sup>1</sup>

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EMERALD ZOYSIA is a hybrid between Japanese lawn grass (*Zoysia matrella* var. *japonica*) and Mascarene grass (*Zoysia matrella* var. *tenuifolia*) which was produced by Ian Forbes at the Plant Industry Station, Beltsville, Maryland, in 1949. A yellow-stoloned *japonica* selection was the female parent and a purple-stoloned *tenuifolia* selection was the male parent. Emerald Zoysia has purple stolons and its selfed progeny segregates 3 to 1, purple to yellow seedlings.

Since many are unfamiliar with the nomenclature and characteristics of the *Zoysia* grasses, the following resume is presented. Recent fundamental studies by Forbes (unpublished) have shown that the three main types of *Zoysia* grown in the United States for turf should be considered varieties of one species, *Zoysia matrella* (L) Merr., rather than as separate species as was previously done. He assigned them the three

varietal names *japonica*, *matrella*, and *tenuifolia*. *Japonica* has the broadest leaves, grows tallest, is the most winterhardy, is the best seed producer, does not produce a fluffy turf, and produces the least dense turf.

*Matrella* has finer leaves, is shorter, is less winterhardy, is a poor seed producer, tends to produce a fluffy turf and a denser turf. *Tenuifolia* has the finest leaves, is shortest, is the least winterhardy, is the poorest seed producer, produces a very fluffy turf and the densest turf. Although they are less winterhardy than *japonica*, *matrella* and *tenuifolia* are more frost tolerant. All of these grasses are more tolerant to frost and shading than Bermudagrass with the exception that *japonica* and Bermudagrass are about equal for frost tolerance. They are much slower in stolon and rhizome growth than Bermudagrass, which is a disadvantage in their establishment, but an advantage in their control.

Clonal divisions of Emerald Zoysia were tested for turf characteristics at Beltsville from 1950 to 1952 and at the Georgia Coastal Plain Experiment Station, Tifton, Georgia, from 1952 to 1954. At both locations, they were compared with *japonica*,

1. Cooperative investigations at Beltsville, Maryland, and Tifton, Georgia, of the Field Crops Research Branch, A.R.S., U. S. Department of Agriculture, the Georgia Coastal Plain Experiment Station, Tifton, Georgia, and the U. S. Golf Association Green Section.

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*matrella*, *tenuifolia* and Meyer *Zoysia*. Meyer *Zoysia* is an improved fine-leafed agronomic variety of *japonica*. The results obtained in the Beltsville test are presented in Table 1 and those from the Tifton tests in Tables 2 to 4.

#### Best Rating Score

Emerald *Zoysia* had the best total turf rating score at both locations in all years. It is apparent that this hybrid combines to varying degrees the greater winterhardiness, non-fluffy growth habit and faster rate of spread of its *japonica* parent with the finer leaves, denser turf, and darker green color of its *tenuifolia* parent. It exhibits hybrid vigor in rate of spread at both Tifton and Beltsville, and in the browning and density ratings at Tifton. All of these characteristics are desirable in a turf grass, but the desirability of the non-fluffy character may not be clear to some.

The non-fluffy turf is produced as a result of short culm internodes which result in the newer leaves being produced at almost the same level above the soil surface as the older leaves were. This prevents the eventual scalping of all of the green leaves from a particular culm during the mowing operation. Fluffy turf, produced by *Zoysia* grasses having long culm internodes, is susceptible to scalping which results in exposing dead grass leaves and naked culms, giving the turf an unsightly appearance.

Emerald *Zoysia* received its name because of its beautiful dark green color. Since it is a hybrid which resulted from a wide cross, it must be propagated vegetatively to preserve its superior characteristics. The fact that the selfed progeny of Emerald *Zoysia* segregates for numerous vegetative characteristics and pigmentation of coleoptiles, stolons and other plant parts may be used for identification purposes.

#### Stock to be Released

Foundation planting stock of Emerald *Zoysia* will be released (subject to final approval of the Board of Directors of the Georgia Crop Improvement Association at

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## COMING EVENTS

1955

#### February 7-8:

Mid-Atlantic Association of Golf Course Superintendents Turf Conference—Lord Baltimore Hotel, Baltimore, Md. E. N. Cory.

#### February 7-11:

One Week Turf Course, Rutgers University, New Brunswick, N. J. Ralph E. Engel.

#### February 14-17:

Penn State Turf Conference, Pennsylvania State University, State College, Pa. H. B. Musser.

#### February 21-24:

Cornell Turf Conference, Ithaca, N. Y. John F. Cornman.

#### March 7-9:

Midwest Regional Turf Conference, Purdue Memorial Union, Lafayette, Ind. Dr. W. H. Daniel.

#### March 9-11:

Minnesota Turf Conference, Curtis Hotel, Minneapolis, Minn. Roy W. Nelson, Secretary, Minnesota Golf Course Superintendents Association, 2621 Jersey Ave., Minneapolis, Minn.

#### April 5-6:

Annual Southeastern Turf Conference, Tifton, Georgia, B. P. Robinson.

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their annual meeting in February) next month by the Georgia Coastal Plain Experiment Station, Tifton, Georgia, to nurserymen who qualify as growers of certified stock. Those interested in so qualifying should contact Mr. Hugh A. Inglis, Georgia Crop Improvement Association, Inc., Athens, Georgia. Nurseries should have some sprigs for sale to the public in the spring of 1956.

The zone of adaptation of Emerald *Zoysia* is not fully known. At present, it is not recommended to be planted further north than a line from Washington, D. C. west to St. Louis, Missouri. As the grass is being tested at several state experiment stations, more definite information will be available on this point in the future.

**You can't help a little child up the hill without getting nearer the top yourself.**

TABLE 1. Comparative ratings of five *Zoysia* grasses for winterhardiness, rate of spread, turf quality and compatibility with Kentucky bluegrass at Beltsville, Maryland, in 1950 to 1952.

Name of grass	Ratings* made on dates indicated for:					Totals
	Winter	Density	Bluegrass	Rate of	Leaf	
	hardiness		compatibility	spread	width	
	6-5-51	7-8-51	1-11-52	1-11-52	6-6-50	
Emerald <i>Zoysia</i>	1	1.4	8.0	1.4	3	14.8
Meyer <i>Zoysia</i>	1	3.0	7.3	1.0	6	18.3
Common <i>japonica</i>	1	5.2	3.0	5.0	10	24.2
Commercial <i>matrella</i>	5	2.0	10.0	6.4	3	26.4
Common <i>tenuifolia</i>	10	—	—	—	1	—
LSD at 5% level	—	1.1	1.8	1.5	—	—
LSD at 1% level	—	1.5	2.4	2.1	—	—

\*Averages of nine replications for winterhardiness and three for all other ratings.

Legend of rating methods:

Winterhardiness: 1 = 0% winterkill; 10 = 100% winterkill.

Density: 1 = densest turf; 10 = thinnest turf.

Bluegrass compatibility: 1 = most bluegrass in association;  
10 = least bluegrass in association.

Rate of spread: 1 = most rapid; 10 = slowest.

Leaf width: 1 = finest; 10 = coarsest.

TABLE 2. Comparative turf ratings of five *Zoysia* grasses at Tifton, Georgia, in 1952.

Name of grass	Rate of spread	Ratings* made on Oct. 10, 1952 for:					Total
		Texture	Density	Growth habit	Browning	Color	
Emerald <i>Zoysia</i>	2	3	1	2	1	1	10
Meyer <i>Zoysia</i>	3	5	3	1	2	2	16
Common <i>japonica</i>	3.5	7	5	1	2	3	21.5
Commercial <i>matrella</i>	2	2	2	4	4	2	16
Common <i>tenuifolia</i>	5	1	2	5	5	2	20

\*Ratings based on single 8 x 8 foot plots.

Legend of rating methods:

Rate of spread: 1 = most rapid; 5 = slowest.

Texture: 1 = finest leaves; 7 = coarsest leaves.

Density: 1 = densest turf; 5 = thinnest turf.

Growth habit: 1 = least fluffy (shortest culm internodes);  
5 = fluffiest (longest culm internodes).

Browning: 1 = fewest dead leaves showing; 5 = most dead leaves showing.

Color: 1 = darkest green; 5 = lightest green.

TABLE 3. Comparative turf ratings of five *Zoysia* grasses at Tifton, Georgia, in 1953.

Name of grass	Ratings* made on August 25, 1953, for:					Total
	Texture	Density	Growth habit	Browning	Color	
Emerald <i>Zoysia</i>	3	1	2	1	1	8
Meyer <i>Zoysia</i>	5	3	1	3	2	14
Common <i>japonica</i>	7	5	1	3	3	19
Commercial <i>matrella</i>	2	2	4	4	2	14
Common <i>tenuifolia</i>	1	2	5	5	2	15

\*Ratings based on single 8 x 8 foot plots, rating methods same as in Table 2.

TABLE 4. Comparative turf quality of five *Zoysia* grasses at Tifton, Georgia, in 1954.

Name of grass	Ratings* made on Nov. 2, 1954, for:						Total
	Texture	Density	Growth habit	Rate of spread	Browning	Color	
Emerald <i>Zoysia</i>	3.0	1.0	2.0	2.0	1.5	1.0	10.5
Meyer <i>Zoysia</i>	5.0	3.0	1.0	3.0	2.0	2.0	16.0
Common <i>japonica</i>	6.5	5.0	1.0	3.5	3.0	2.5	21.5
Commercial <i>matrella</i>	2.0	2.0	4.0	2.0	3.0	1.5	14.5
Common <i>Tenuifolia</i>	1.0	2.0	5.0	5.0	5.0	2.0	20.0
LSD at 5% level	0.6	0.8	0.3	1.6	1.5	1.0	—
LSD at 1% level	0.8	1.2	0.4	2.2	2.1	1.4	—

\*Average of two replications, rating methods same as in Table 2.

## GOOSEGRASS

Goosegrass grows throughout almost the entire United States. It is almost a universal pest in turf areas. It is found in greens, on fairways, on tees, and lawns and it thrives in both shade and sun. Goosegrass is not the only name for this pest. It is called silver crabgrass, crowfoot, irongrass and perhaps other names. Quite often the names are not complimentary. This is an extremely tough grass that germinates in the spring shortly after the crabgrass germination season, and it persists until frost. The low-spreading habit makes it very difficult to cut, and it tends to kill out the grasses around it by enlargement of the rosette-like crown. Goosegrass is found rather frequently on heavy, compacted soils that are subjected to a great deal of wear. Because of its toughness, goosegrass is able to withstand this very heavy wear and it might be a good wear-resistant turfgrass except for the fact that it grows in small clumps or rosettes and does not make a smooth, uniform turf. The following description of this grass is quoted from Hitchcock's Manual of the Grasses of the United States:

"Branching at base, ascending to prostrate, very smooth; culms compressed, usually less than 50 cm. long, but sometimes as much as 1 m.; blades flat or folded, 3 to 8 mm. wide; spikes mostly 2 to 6, rarely more, or but 1 in depauperate plants, flat, 4 to 15 cm. long."

This technical description may not mean a great deal to the layman but it does serve

to describe the plant. The grass resembles crabgrass somewhat except that it is very smooth and it is a much tougher grass. When subjected to traffic, it sticks much closer to the ground. It does not root at the nodes on the branches as does crabgrass. The very tough seed heads have a silvery appearance, hence the name silver crabgrass.

The control of this pest is one of the challenges facing research workers all over the United States. At the present time there is no known control for it. Some success has attended the use of phenyl mercury materials mixed with 2,4-D. Neither of these materials by itself has been successful. Rates of application have not been standardized and those wishing to experiment with these compounds in a mixture should proceed with extreme caution. Various rates should be applied on small areas of turf until the correct proportion and rates are determined. Treatment should be made in the spring when the young seedlings appear.



This is goosegrass. Note the hard compact soil of the pathway in which it is growing. It tolerates heavy wear and compact soils.