UT Extension

W160-E

Turfgrass Establishment Turfgrass Seed

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The climate and soils of several valleys in Idaho, Oregon and Washington are well-suited for the production of fescue, Kentucky bluegrass and ryegrass seed. Much of the bermudagrass seed marketed in the southern U.S. is produced in Arizona and New Mexico. Seed producers contract to grow individual turfgrass cultivars from "foundation" seed stocks. Harvest begins when seeds are mature and relatively dry. After cleaning, each seed lot is assigned a number and seed samples are submitted for testing.

Grass seeds come in many shapes and sizes. Seeds of tall fescue are relatively large and long compared to Kentucky bluegrass. There are about 230,000 tall fescue seeds per pound and about 2,200,000 Kentucky bluegrass seeds per pound. Seeds of *Zoysia japonica* are usually larger than Kentucky bluegrass seeds and smaller than tall fescue seeds. Mechanical injury during combining and seed cleaning can reduce seed viability. The normal percentages of viable seed in a package of seed and seed purity also vary among turfgrass species.

Tall Fescue

Kentucky Bluegrass

Zoysia japonica

Approximate number of seeds per pound and minimum acceptable purity and germination percentages of several turfgrasses.

Species	Approximate Number of Seeds Per Pound	Minimum Purity (%)	Minimum Germination (%)
Cool-season			
Bluegrass, Kentucky	2,200,000	90	75
Fescue, chewings	500,000	95	80
Fescue, sheep	530,000	95	80
Fescue, strong creeping	615,000	95	80
Fescue, tall	230,000	95	85
Ryegrass, annual	230,000	95	90
Ryegrass, perennial	230,000	95	90
Warm-season			
Bermudagrass, common (hulled)	1,750,000	95	80
Centipedegrass	410,000	45	65
Zoysia japonica	1,000,000	90	70

Seed Blends. Blending varieties of the same species may be advantageous when, for example, varieties in the blend have superior tolerance to one or more insects or disease, but no one variety resists all the insects and diseases that normally occur. Presently, blends of highly compatible varieties of bermudagrass, Kentucky bluegrass, perennial ryegrass and tall fescue are marketed in Tennessee. In mature turfs, it is usually very difficult to distinguish between plants of these varieties with similar colors and textures.

Seed Mixtures. The range of adaptation of single-species plantings may be limited. Traditionally, mixtures of two or more turfgrass species have been used when the climate (e.g., wind, temperature and humidity) and soils (e.g., compaction, fertility, internal drainage and depth) vary throughout the landscape. Mixing seeds of several species may improve the insect, disease and wear resistance, recuperative capacity and shade tolerance of a turf. Eventually, turf established from a seed mixture may appear patchy due to isolated areas of individual, contrasting species.

Mixing ryegrass as a companion seeding with fescues and bluegrasses is usually discouraged. Although annual and perennial ryegrasses are short-lived, seeds germinate quickly and seedlings grow very rapidly, competing with other slower-growing species for available light, nutrients and water. However, mixing compatible varieties of chewings, hard and creeping fescues can be very advantageous when establishing a shaded turf from seed. Strong creeping fescue is a shade-tolerant, sod-forming species that grows well in humid areas. Chewings fescue has a bunch-type growth habit, excellent shade and cold tolerance and is less tolerant of drought than strong

creeping fescue. Although not as deeply rooted as chewings or strong creeping fescues, hard fescue is more tolerant of high temperatures.

Always consider seed count when selecting a seed mixture. Varieties in a mixture are listed by weight rather than by the number of seeds. One pound of a mixture of 80 percent Kentucky bluegrass, 10 percent strong creeping fescue and 10 percent perennial ryegrass by weight contains about 95.4 percent (1,760,000 seeds) Kentucky bluegrass, 3.3 percent (61, 500 seeds) strong creeping fescue and 1.3 percent (23,000 seeds) perennial ryegrass by seed number.

Seed Coatings. Seeds are often coated with lime, fertilizer and/or a fungicide. Coatings may enhance the growth rate of seedlings or protect them from fungi. Coating seeds also increases the weight of each seed "unit" and decreases the total seed count per pound.

The Seed Label. In addition to identifying the species and variety, a label contains valuable information regarding the quality of the seed in a container. The label of turfgrass seed sold, distributed, transported and offered for sale in Tennessee must contain the following information:

a) Name of the kind and variety for each turfgrass seed present in excess of 5 percent of the whole and the percentage by weight of each in the order of its predominance;
b) Lot number or other lot identification;
c) Net weight;
d) Origin;
e) Percentage by weight of inert matter;
f) Other crop seeds (e.g., percentage by weight of varieties other than those listed on the label);
g) Percentage by weight of all weed seeds;
h) Germination percentage (exclusive of the germination of hard seed), percentage of hard seed, and the calendar month and year of the test for each named turfgrass seed;
I) Name and number per pound of each kind of restricted, noxious weed seed; and
j) Name and address of the company or person labeling, selling or offering the seed for sale.

Seed may also be guaranteed true-to-type, or certified, from a genetic standpoint. Blue-tag certified seed has been tested according to procedures established by the Association of Official Seed Certifying Agencies (AOSCA) and has met stringent certification standards for genetic purity and identity.

Pure Live Seed. The retail price of seed is influenced by turfgrass species and variety, germination and purity. A calculation to determine the percentage of pure live seed (PLS), where PLS (%) = [seed purity (%) x seed germination (%)] ÷ 100, makes it possible to compare two or more containers of seed and identify the best value.

A comparison of two seed lots based on pure live seed is on page 4.

References:

Beard, J. B. 2002. Turf Management for Golf Courses, 2nd Ed. U. S. G. A., Ann Arbor Press, Chelsea, MI, pp. 738 -739.

Emmons, R. D. 1984. Chapter 9 Establishment *In* Turfgrass Science and Management, Delmar Publishers, Inc., Albany, NY, pp. 129 - 158.

Turgeon, A. J. 1999. Chapter 8 Propagation In Turfgrass Management, 5th Ed., Prentice Hall, Upper Saddle River, NJ, pp. 290 - 329.

The least expensive seed on the basis of price per pound is not always the best value.
Consider example seed lots A and B:

Seed Lot A
Cost = $1.31 per pound

Species	Tall Fescue - Titan
Origin	Oregon
Tested	July 29, 2004
Germination	95
Other Crop	0.15
Weed Seed	0.5
Noxious Weeds	0.0
Inert	1.4

Seed Lot B
Cost = $1.28 per pound

Species	Tall Fescue - Titan
Origin	Washington
Tested	August 1, 2004
Germination	90
Other Crop	0.4
Weed Seed	0.4
Noxious Weeds	0.0
Inert	1.2

Seed Lot A
PLS (%) = [Germination (%) x Purity (%)] ÷ 100
Germination (%) = 95
Purity (%) = 100 - 0.15 - 0.5 - 1.4 = 100 - 2.05 = 97.95
PLS (%) = [95 x 97.95] ÷ 100 = 9305.25 ÷ 100 = 93.0525

Seed Lot B
PLS (%) = [Germination (%) x Purity (%)] ÷ 100
Germination (%) = 90
Purity (%) = 100 - 0.4 - 0.4 - 1.2 = 100 - 2.0 = 98
PLS (%) = [90 x 98] ÷ 100 = 8820 ÷ 100 = 88.20

The following formula is used to compare the retail price of two or more seed lots on the basis of PLS (%):
Retail price per pound PLS = [retail price per pound / PLS (%)] x 100

Seed Lot A: ($1.31 ÷ 93.0525) x 100 = 0.01407 x 100 = $1.41
Seed Lot B: ($1.28 ÷ 88.20) x 100 = $ 0.01451 x 100 = $ 1.45

Although the retail price of seed lot A is 3 cents higher per pound than seed lot B, seed lot A is 4 cents less per pound PLS and is the best value.

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