

Grass Seeds for Lawns and Turf

ROBERT W. SCHERY

THE PRODUCTION and use of seeds for lawns and turf have grown in a few decades to match almost any agricultural enterprise.

The volume of the marketed seeds is not quite so great as that of alfalfa and corn, but the land upon which it is sown probably outvalues the acreage in corn and alfalfa.

It is an outgrowth of America's move to the suburbs; a desire for attractive lawns; an expanded highway program that calls for parklike rights-of-way; the establishment of new airports, golf courses, and industrial parks; and the continuing search for attractive turf for cemeteries, athletic fields, public buildings, schools, and parks.

We spend an estimated 2 to 3 billion dollars yearly to create and maintain about 12 million acres of nonagricultural turfgrass. The land value of this acreage is perhaps 25 billion dollars. Its seeding utilizes more than 100 million pounds of grass seeds annually.

Of this "lawn seed" (to distinguish it from agricultural usage), about one-third is of first quality—mostly perennial species of attractive texture. One-third is permissible but not of top quality—mixtures with lesser amounts of quality species and some coarse or impermanent species. One-third is of a trashy sort—impermanent "hay-grass" mixtures.

The grasses that make up lawn mixtures originally were pasture species.

Many of us can remember how people scattered the sweepings from haymows around the farmstead to make lawns. This casual use of agricultural

seeds gradually gave way to the sowing of better, cleaned seeds, packaged for lawn use even if it were of agricultural origin and to growing and harvesting seed specifically for fine turfs.

As the industry has progressed, standards have risen so that good mixtures now contain essentially weed-free seeds of fine-textured species, guaranteed to germinate satisfactorily. Some bulking with agricultural seed still continues in trash mixtures for mass-outlet sale, at a price, to unsuspecting homeowners.

The greatest market is in northern States. Species adaptable to cooler climates start readily from seeds, of which an abundant supply can be produced economically. Moreover, because of apomixis—reduced sexual crossing—the bluegrasses and lawn fescues maintain their identity well in varietal selection.

Seed sales in the South have centered mostly around common bermudagrass and, to a lesser extent, bahia, carpet, and centipede, with a little unselected zoysia. The improved varieties of bermuda and zoysia must be vegetatively planted, as they do not come true from seeds. St. Augustine, an inadequate seeder, also is planted vegetatively, as is much centipede turf.

The plains west of eastern Kansas have had no great development of the lawn types tailor-made for that climate. There has been some commerce in and selection of buffalograss, a species able to exist with limited rainfall.

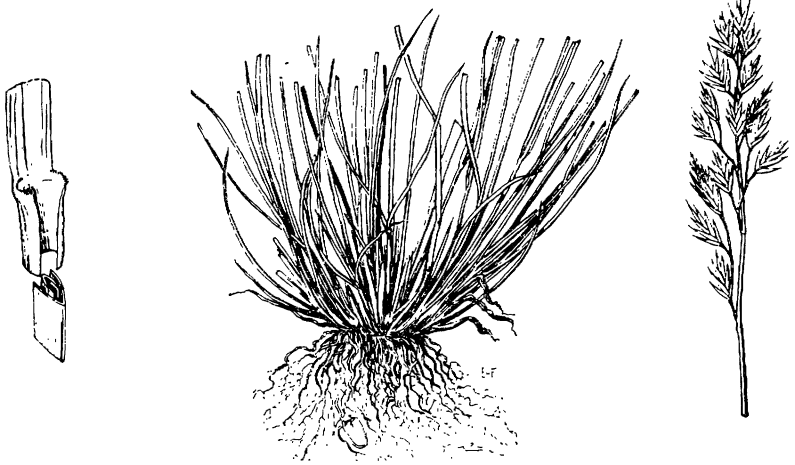
Several of the grammas, lovegrasses, wheatgrasses, and such have been seeded now and then for turf, but none is so attractive as the conventional eastern turfgrasses.

Because cities generally have enough water to permit irrigation of lawns and the use of the familiar humid-zone species, little commerce has arisen in specialties for arid lands.

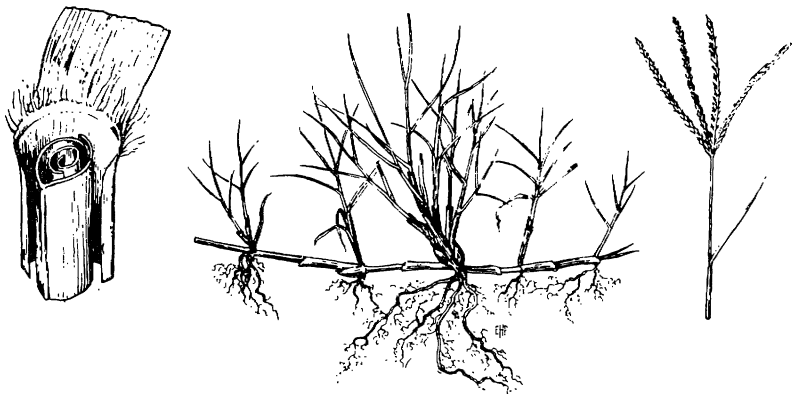
The production of grass seeds is detailed in earlier chapters. Here I review three of the major species as examples of how production bears on quality, supply, and costs.



Poa pratensis—Bluegrass



Festuca rubra—Red Fescue



Cynodon dactylon—Bermudagrass

Vegetatively planted southern species (like creeping bentgrasses for northern golf greens) must be dismissed with the mere notation that they are mostly nursery grown in their appropriate climatic areas. Improved varieties can be bought at turfgrass establishments in the South and the Southwest.

The three leaders are the bluegrasses; varieties of fine fescue, mostly from Oregon; and bermudagrass.

Domestic and perennial ryegrasses account for most of the seed going into temporary cover (as winter grass in the South) or the cheaper mixtures. Production of ryegrass is as much for agricultural purposes as for lawns, and I pass over this segment of the industry.

KENTUCKY BLUEGRASS was the settler's partner in early colonization. Production gradually shifted from the East to west of the Mississippi as lands became more valuable and intensively cropped in the Corn Belt. The only center of production remaining in the East is the section near Lexington, Ky., where tradition and especially favorable soils continue to make bluegrass and livestock important.

In the western district—northward and westward from Missouri—production of seed of natural Kentucky bluegrass likewise works in partnership with livestock. Seed is harvested from the same turf grazed or mowed for hay at other seasons. Experience has demonstrated the appropriate management of this ecological complex, so that grazing, fertilization, control of weeds, and suchlike have become perfected. Seed harvesting moved northward and westward, as the bluegrass volunteered on the newly plowed up prairie. Minnesota, North Dakota, and South Dakota are important sources of natural bluegrass seed in some years, as are Iowa, Missouri, and Kentucky.

Economic, biologic, and marketing advantages reside in the system that has evolved for the production of natural bluegrass seed. Use by livestock of the acreage during nonseeding

seasons constitutes a sort of subsidization of seed production on what has become expensive, heavily capitalized land. Furthermore, most sods have lain unpampered for years, some since colonization. The diverse strains that result should be especially hardy because they have been subject to whatever natural selection there might be for generations. Midcontinent seed also is closer to the main urban markets, and so there are transportation advantages.

On the other hand, because bluegrass volunteers everywhere in the East and Midwest, it becomes difficult to keep selected lines pure if pure lines should be wanted for certain attributes. Also, with the multiple uses to which such acreage is put, it sometimes is difficult to manage especially for seed. Consistently high yields, which may reduce unit harvesting costs, are not certain. The cultivation of named selections consequently has moved mostly to the newer, often irrigated, lands of the Pacific Northwest.

In a few sections, Kentucky especially, some farmers may own their own stripping machines, care for the pastures carefully, and harvest and deliver seed to local cleaning plants. Green seed—fresh, uncured seed, which is subject to fermentation and loss of viability unless it is spread out to cure within a few hours—may be sold at a few cents a pound to the cleaner and be cured—dried—in the curing yards of that company.

Larger farmers may operate their own curing yards. Sometimes they buy green seed from neighbors to supplement their supply. The cured seed may be sold to the cleaning plant or it may be custom cleaned on a fee basis.

In the western district, where extensive areas must be covered, most stripping is done by fleet strippers belonging to companies large enough to capitalize them and their maintenance. Farmers may arrange for use of stripping machines by any of numerous agreements. Sometimes the farmer supplies tractors and labor, and the com-

pany furnishes the machines. The crop is shared. The farmer may then sell his share to the operator for cash. Or, a company may buy stripping rights to farm acreage. Or, strippers may be issued to a farmer with an understanding that the green seed be delivered only to the operator's curing yard. Independently stripped lots of seed are subject to visual judgment by an experienced bluegrass hand at the curing yard to determine its worth. A percentage for dockage is agreed upon by buyer and seller, upon estimate of the quality of the green seed—fullness and maturity of seed, the amount of trash and weeds, the moisture content, and so on.

Such varieties of bluegrass as Arboretum, Delta, Merion, Newport, and Park generally are row cropped by the usual agricultural procedures. Many of the large growers in the Northwest operate their own cleaning plants and undertake all operations from production through to wholesale sales.

Growers have banded together to form associations to promote their particular varieties, some of which are produced under certification. The usual plan is to levy a voluntary assessment of a few cents a hundred-weight, to pay for promotion in the eastern market area.

Weather greatly influences supplies of bluegrass seed, especially seed of natural Kentucky bluegrass. Bluegrass that is well cured and cleaned retains its viability for years if it is properly stored. Years of heavy production yield enough carryover supplies to offset a lean year. Prices therefore tend to have some stability, although the market generally reflects supply and demand: Heavy production, lower prices; a lean crop, higher prices.

Early harvest, starting in Kentucky and Missouri, is watched closely as an indicator of price trends. The intensity of harvest farther North will depend partly on the abundance and quality of the earlier southern crop. Should crops in Kentucky, Missouri, and Iowa be lean, with prices rising,

activity will be intense in the Dakotas. If, on the other hand, southern supplies are good, only the best acreage in the North will be harvested. An abundant year reduces the price, because of the pressure on supplies and because seed is then more selectively and economically harvested, and marginal acreage is bypassed.

Thus bluegrass seeds exhibit a production duality: Hardy, natural Kentucky bluegrass from east of the Rockies, favored economically by nearness to markets and "subsidization" by livestock; and premium varieties grown agronomically solely for seed in the Pacific Northwest.

Production averages more than 20 million pounds annually from both sources.

THE SECOND major component of good mixtures of lawn seeds for northern regions is the red fescue complex.

There are no especially favored production areas in the Eastern States, such as for bluegrass, where red fescue has become a pasture dominant. Thus, without "livestock subsidization," red fescues cannot compete well for agricultural acreage in the East. Fescue forage has been utilized to some extent in western Canada, however.

Most of the United States production consequently has become concentrated in the Pacific Northwest, especially in Oregon. There the improved varieties are grown under exacting agricultural procedures. High purities and germinations are achieved through close attention to factors of quality.

Without eastern competition, western production dominates the fine fescue market, except for imports, primarily from western Canada.

The domestic production of all varieties, usually more than 10 million pounds a year, often is about matched by imports.

Many of the growers of fescue are also growers of bentgrass, which is produced almost exclusively in the benign climate of western Oregon-Washington.

PRODUCTION of bermudagrass is less than that of bluegrass and lawn fescue.

It was more than 7 million pounds in 1960. Bermuda invasion in the South was as ubiquitous as bluegrass in the North; today it volunteers widely throughout the warmer regions.

Agriculturally, the production of bermuda seed never has been able to compete successfully with other land uses in the Southeast. Thus, just as the growing of lawn fescue moved to the Pacific Northwest, production of bermuda seed ended up in the Southwest, primarily near Yuma, Ariz.

Formerly much bermudagrass seed was harvested in old alfalfa seed fields, in which the grass had volunteered. Alfalfa was especially prone to give way to bermuda on saline places. Where it was in relatively pure stands, this bermuda sod provided excellent yields of seed.

Planting and cultivation recently has been expressly for seed. No pasturing is done. Yields are reliable under irrigation. Harvest is in June and again in November. Because bermuda exhibits sexual crossing, selections do not come true from seed. Thus the only significant marketing distinction depends on whether the hulls are removed or left. Seeds with the hulls removed germinate more promptly. A pound contains about 40 percent more seeds and commands a premium price.

SEED customarily is cleaned to the accepted standards for the species at cleaning plants in the general producing area.

Most cleaned lawn seed is shipped in 100-pound sacks (sometimes 50-pound sacks) in carload lots to blenders or packagers in the sections where it is planted.

Brokerage and distribution services route some lots, but carload or part-carload shipments frequently are made directly from the seed cleaner to the packager's warehouse. There suitable blends for the trade area and the merchandising program of the packager are made. Most seed nowadays reaches

the consumer prepackaged under private brand.

In the North, the chief consuming region for lawn seed, several varieties or species are customarily mixed, or blended. If the selection is skillful, the usefulness of a seed mixture thus is broadened, and adapted grasses are supplied to satisfy the many local variations in growing conditions—shade or sun, wet or dry, close or high clipping, heavy or light fertilization, and so on.

The increasing importance of lawn seeds has spurred research on the ecological question of how grasses best get along together. As a result, the top mixtures have improved.

Many blends limit or exclude bentgrass, once almost always a component of a quality mixture. Bentgrass, inherently an excellent turf species because of its low, fine growth and spreading stolons, has differing requirements from the bluegrass-red fescue component of quality mixtures; under humid conditions it tends to form disruptive colonies in the sward, within which other species may not flourish.

Other studies have pointed out how serious a setback even moderate quantities of quick "nursegrasses" may cause the desired permanent species and how insufficient seeding densities make coarse "weeds" of some plantings.

GOOD, PACKAGED mixtures of lawn seeds can be purchased at any hardware or garden store.

For Tennessee and northward, the mixture should be based primarily upon bluegrasses and the red fescues. A small percentage of quick nursegrass, such as ryegrass or redtop, may be tolerated, but they should not exceed 15 to 5 percent, respectively, of the mixture.

Tall fescue (Alta or Kentucky 31) is best avoided, except for rough areas and playfields, where coarseness is not important. The tall fescues are deep rooted and persistent. Once established, they may stool to clumps that

cannot be removed except by hand digging.

The choice of lawn seeds cannot be separated from the kind of attention the lawn will receive. Presuming appropriate species have been included, how the planting is maintained will be more important than subtle differences in variety or percentage proportions in the mixture.

Full success with a new planting depends on cultivation of the soil and fertilization. Phosphorus should be prominent in fertilizer mixed into the seedbed, since it moves down through the soil only slowly.

A seeding must have constant moisture to sprout quickly. The moisture can be best insured by mulching. Straw, the usual mulch material, may be spread two or three straws deep. It helps prevent drying and reduces soil wash.

Once a seeding is established, the kind of grass determines care. Bentgrass needs close mowing, which is best done with a reel mower, and frequent fertilization, watering, control of diseases and weeds, and so on. Bluegrasses and fescues require less care. They profit most from fertilization in autumn and high clipping (for which a rotary mower is appropriate).

Any turf looks best if it is kept free from weeds. That is easily possible by the use of 2,4-D and any of the various crabgrass killers. Weeds are always less a problem under high mowing than if the lawn is scalped.

In the South, seeded grasses are fewer and have little varietal differentiation. Blending is practiced less than in the North. Bermuda, like bentgrass, is aggressive, and should have its own special management. It is usually sown by itself, planted in spring or summer, because it grows only in the warm season.

After bermuda goes dormant in autumn, some of the northern grasses may be intersown for color in winter. Annual ryegrass is used oftenest. As it dies the following spring, the bermuda can recover. Some lawnsmen are com-

ing to the conclusion that other less competitive northern species, such as bluegrass, *Poa trivialis*, *Poa annua*, and fescue, offer less aggressive competition to the comeback of bermuda in the spring.

BLENDING of seeds, once done by hand, now often is mechanized. In automated operations of the larger companies, storage bins feed seeds directly into a weighing chamber and storage repository. In elaborate plants, appropriate controls can be set to introduce so much of several varieties. Each is checked for weight as it is introduced. The mixture is tumbled in rotating drums for complete mixing.

When the blend is ready for packaging, a worm screw in the center of the storage bin recirculates the seeds so that no differential sorting of types occurs as a result of their differing sizes, weights, or surface characteristics. Thus early and late packages from a blend lot will be identical.

In blending, the packager-seedsman has opportunity to exercise skills that may give him a better product and competitive advantage.

He has opportunity to produce or obtain from reliable sources the cleanest, fullest seeds.

Even though most seeds meet conventional marketing standards, as determined by purity and germination tests, subtle differences may occur, such as size of individual seeds, origin, kind of weeds, and proportion of chaff. Many packagers insist on standards above conventional specifications and pay a premium for such seeds. Beyond this, they may subject seed to a supplemental cleaning to remove the last traces of chaff and weeds. Such exceptionally clean, heavy seeds should give better performance in the lawn.

Skillful blending considers the use to which the turf will be put and the climate where the seeds are to be sold. A company has ample latitude to develop mixtures or blends it feels offer special advantages.

Most lawn seeds are packaged in

units ranging from a few ounces to many pounds. Cardboard boxes constitute the usual package, but much is marketed in plastic sacks. As long as the seeds are not subjected to unduly high humidity or exceptionally warm temperatures, almost any packaging will keep seed satisfactorily. Most seeds endure well if the moisture content is low and temperatures are no higher than room level. Cold will not harm seeds; indeed, frozen seeds remain viable exceptionally well.

Every step of the way, lawn seeds must meet requirements of State and Federal laws. The laws were passed originally to regulate agricultural seeds at a time when lawn seeds were relatively unheard of. Consequently, some are questionable—for example, many noxious weeds troublesome in agriculture do not persist in a mowed lawn. Standards for germination and purity, however, govern nongenetic qualities in lawn seeds the same as in agricultural applications. All seeds entering commerce are subject to the laws of the State in which they are sold and to the Federal Seed Act when shipped interstate.

Seeds in commerce are continuously sampled by control officials. They must be properly labeled or tagged to indicate weeds, germination, and purity. They must conform to State requirements as to weeds considered noxious in that State. Should the test samples not conform to label statements or requirements, a stop-sale order is issued, and the seeds are impounded. The purveyor may then be subject to civil proceedings. States have laboratories for checking samples, and many private laboratories analyze seeds on a fee basis.

BULK SALES from 100-pound sacks on the floor are becoming a thing of the past. Only packaged seed is available in many garden centers. This leads to vigorous merchandising and efforts toward brand identification—on the whole, a good development in that it fixes responsibility more certainly. A

list of ingredients, with germination percentages and weed content, must appear on the retail package.

If the customer will familiarize himself as to the preferable species for his climate, he can decide readily the quality of a purchase. He will be less apt to buy lawn seed by price and buy according to what is in the package.

Research departments of major seed-houses and industry groups provide reliable instructions for use of their products. Their staffs keep abreast of the research nationally and interpret findings for public benefit. The hope is that the public will be induced to choose its grasses ever more wisely.

THIS EVER-GROWING responsibility of the seed industry to gather and disseminate sound information is recognized by many.

There also is a trend toward horizontal integration. So many products that affect the performance of a seeding are introduced each year that a seed company cannot risk ignorance of herbicides, insecticides, fertilizers, soil amendments, sprinklers, mowers, applicators, and a host of other items.

The realization is growing that one who plants seeds is less interested in seeds as such than in the hoped-for outcome of planting the seeds—a good lawn. A good lawn will result only from good seeds that are treated correctly. That means that one must have information about correct fertilization, watering, mowing, and so on if users of seeds are to be satisfied.

Many seedsmen therefore have become well-rounded experts, who have learned a great deal about the chemicals and equipment that can help good seed become good turf.

ROBERT W. SCHERY is director of the Lawn Institute, Marysville, Ohio. He is a native of Missouri and was educated at Washington University, from which he holds a doctorate. He is the coeditor and co-author of *The Flora of Panama* and the author of two books, *Plants for Man* and *The Lawn Book*.