

NO FRILLS FUTURE MAY REQUIRE CLOSER ATTENTION TO TURF SELECTION

By Robert W. Schery, Director, The Lawn Institute

Maybe it's just as well we don't see the future clearly. We just might dash for cover and try nothing! Although the crystal ball be clouded, past happenings do shape the future and we can draw inferences from them. An era of affluence in America is almost certainly tapering off, and this will appreciably influence those minding turf.

Except, perhaps, for a few luxurious sportsfields supported by huge spectator crowds (and often TV revenues), we can expect stringencies. Since budgets seldom keep pace with costs and taxpayer recalcitrance to government spending is commonplace, the broad sweep of park and recreational grass management will need to increasingly concentrate on essentials. Necessary measures will need clarification; frills may have to go. Know-how and professionalism no doubt will be rewarded, but I foresee impatience with wastefulness in a world that has its fill of shortages and disruptions.

To deal precisely with "essentialness," one must be cognizant of today's dramatis personae of the turf. Only by knowing the grass is it possible to plan its care intelligently, and to decide the degree of

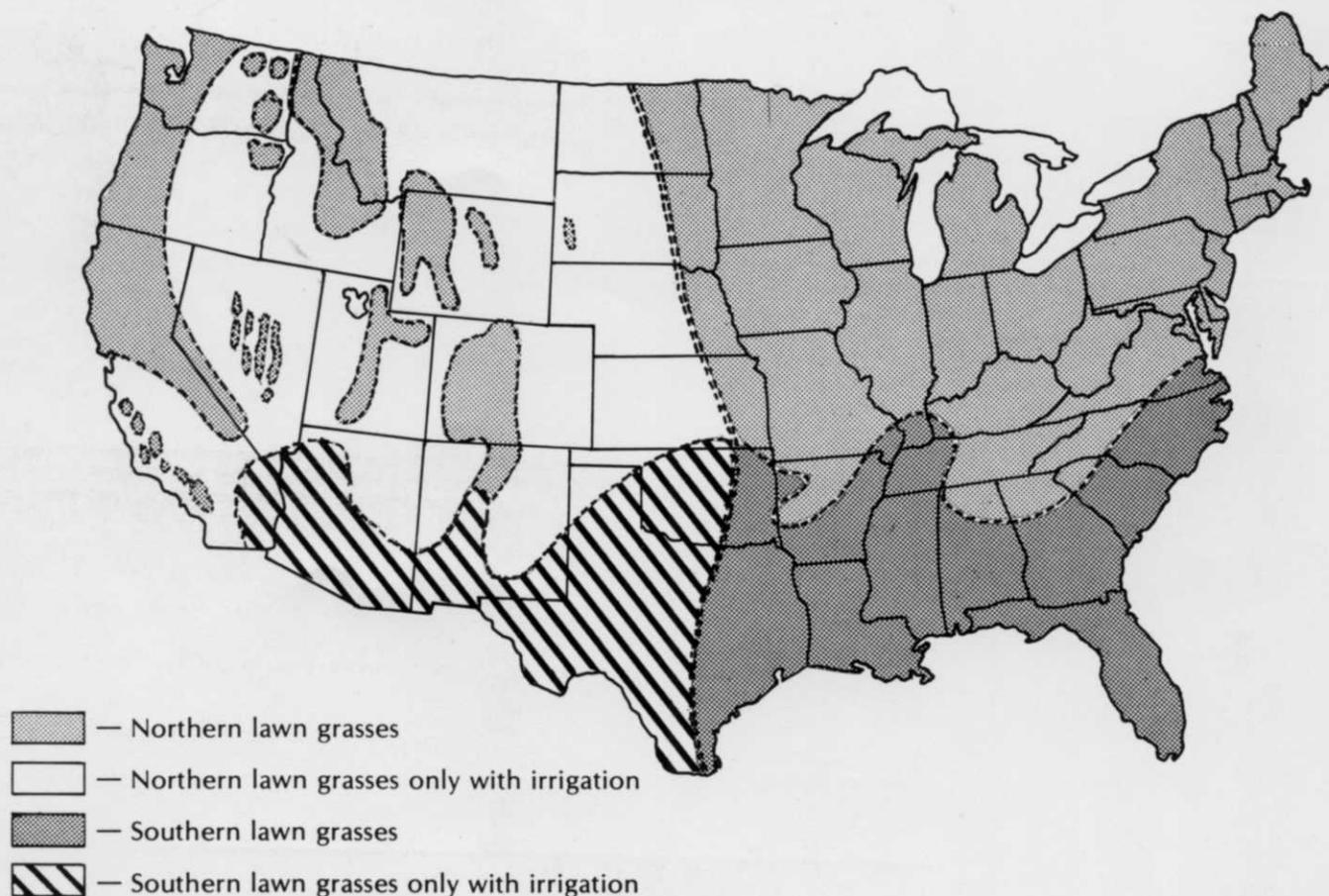
flexibility warranted under prevailing local conditions. Surely mowing, weeding, and in many climates, watering, cannot be denied, although increased efficiency in their practices may be called for. Ceasing fertilization would sacrifice a most effective maintenance technique, but plantings of lesser importance can hardly be expected to receive the generous feeding advised by turfgrass authorities.

Yet turf can be kept quite attractive as well as useful under minimal maintenance. There has been a tendency, I think, towards oversolicitousness, and overly complicated programs in the tending of turf. Under a scenario likely for the future, intensive care may be ruled out due to the law of diminishing returns for all except specialty plantings.

Turfgrasses, the modern image

Of course any grass must be adapted to the climate where used. The map of the United States shows major regions dictated by warmth and rain-

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fall. For the southland, the bermudagrasses (*Cynodon*), St. Augustine (*Stenotaphrum*), and bahia (*Paspalum*) are used in the deeper Southeast. These warm weather species spread mostly by trailing stolons. Because of their aggressive spreading nature, they tend to form solid patches,

and are seldom planted as mixed populations. Thus, most southern lawns are meant to be a monoculture. Select varieties seldom come true from seed, so improved strains are used for the most part, planted vegetatively from sod, plugs, or sprigs. Indeed, only common bermudagrass, bahia-

Cultivars of Northern Lawngrass Species approved by the Lawn Institute's Variety Review Board.

Kentucky Bluegrass, *Poa pratensis* - makes good sod from spreading rhizomes, easily maintained, but somewhat slow to establish.

Adelphi - Rutgers hybrid, on most recommended lists; good quality, habit, and winter color; resists diseases and iron chlorosis; endures low maintenance.

Arboretum - Ecotype from stressful Missouri habitat, with good stick-to-itiveness under minimum care; natural type best mowed fairly tall.

Baron - Low-growing selection from Holland with allround good traits and wide adaptability; a leading sod cultivar; blends suggested for lengthier persistence.

Birka - Top rating selection from Sweden; persistent, tolerant of low maintenance and light shade; winter color and drought resistance not outstanding, but adapts well generally.

Bonnieblue - Hybrid beauty from Rutgers, decumbent, with excellent color and long season; good disease tolerance and endures acidity.

Enmundi - Selection of high quality from Holland, noted for *Fusarium* resistance; decumbent, leafy, attractive even under low mowing; endures acidity.

Fylking - Swedish selection, elegant, decumbent, adapted to low mowing; some disease, but usually not too serious; has shown good salinity tolerance in California; not aggressive, so especially suited to mixtures and blends.

Glade - Selection from New York, low, dark, rather slow-growing; good in shade because of resistance to mildew; endures acidity; well-suited for blends.

Majestic - Handsome Rutgers hybrid, dense, strongly rhizomatous; excellent general qualities; among best in hot weather in California.

Merion - The original standard of excellence among bluegrasses; exceptionally dense and aggressive, wearing well; suffers from certain diseases, but has excellent resistance to leafspot; not a low-maintenance cultivar, needing generous fertilization; drought and iron chlorosis tolerance is good but salinity tolerance is low.

Nugget - Selection from Alaska, neat, dense, dark green; gives great summer performance, but greens late; best adapted northward; suffers somewhat from dollarspot and *Fusarium*; good in shade because of mildew tolerance; adapts to low maintenance.

Plush - Selection from New Jersey with moderate disease resistance that seems widely adapted; withstands low maintenance, drought and acidity rather well; a good general purpose cultivar.

Ram I - Discovered on a Maine golf course, endures low mowing and acid soils; good in blends and mixtures; spreads unobtrusively to make stout sod.

Sydsport - Vigorous, fairly broad-bladed Swedish introduction with excellent ratings in Europe and America; only mildly susceptible to most diseases; resists iron chlorosis much recommended for sportsturfs.

Touchdown - Highly thought-of selection from a Long Island fairway, becoming widely recommended; dense, low and strong even with only moderate fertilization (so may thatch a bit); resists disease well.

Perennial Ryegrasses, *Lolium perenne* - ryegrasses sprout quickly, but do not spread, and are generally not so hardy as bluegrasses in extreme climates. Almost all leading cultivars are polycrosses, most based upon germplasm developed at Rutgers. Compared to common ryegrass they are low-dense, rich green, winter hardy, and mow neatly.

Blazer - A dark green Pickseed proprietary, with good heat tolerance and nice appearance.

Citation - A Turf-Seed cultivar, resistant to heat and wear, companionable for mixtures.

Derby - An International Seeds variety rating highly nationally; among the top three in California.

Diplomat - A Loft cultivar of overall fine quality.

Fiesta - An excellent Pickseed proprietary that withstands stress and most diseases.

Manhattan - Whitney-Dickinson's definitive Rutgers polycross, utilizing bloodlines mostly proved by natural selection in Central Park; excellent hardiness; among top three in California.

NK-200 - A Minnesota selection by Northrup-King, noted for winter hardiness (may be weaker in hot weather).

Omega - A Turf-Seed cultivar attractive summer and winter; wears well.

Pennfine - A leading national cultivar developed at Penn State, competitive and especially strong in summer; among top three in California.

Regal - North American Plant Breeders proprietary, attractive and strong under summer heat.

Yorktown II - Lofts high-rating variety, elegant and durable.

Fine Fescue, *Festuca rubra* - Well adapted to dry, infertile soil and shaded locations; often suffers stress from summer humidity, so that permanency is better in northern climates. northern climates.

Banner - Rutgers 45-clone Chewings polycross, doing especially well under coastal conditions.

Ensylva - A spreading polycross from Holland, well adapted to mixtures.

Highlight - Handsome Chewings introduction from Holland, one of the most brilliant of the fescues.

Koket - A Chewings polycross from Holland, strong, generally untouched by diseases.

Ruby - A spreading fescue from Holland; most used in mixtures and for special purposes (e.g. roadside seeding).

Colonial Bentgrass, *Agrostis tenuis* - A natural ecotype that persists under minimum maintenance, **Highland**.

Creeping Bentgrass, *Agrostis palustris* - Two lawn types are of note, **Emerald** is a pedigreed pureline out of Congressional, attractive and not too demanding; and **Prominent** is an eight-clone Scandinavian selection that survives neglect and resists *Poa annua*.

Rough Bluegrass *Poa trivialis* - **Sabre** selected at Rutgers, is an excellent golf green winterseeding species; adapted to moist shade in the North

grass, and to a limited extent centipedegrass, are offered as seed.

Pure lines from seed are the norm with the temperate species of northerly regions. Except for bentgrasses and a few specialty cultivars, the grasses spread by underground rhizomes or are bunchgrasses. They accommodate well to mixed plantings (i.e. seed mixtures), which broadens adaptability and usefulness. For example, fine fescue in a mixture survives in dry shade on poor soil, while in more favorable habitat bluegrass contributes the stoutest of sods needing only moderate care. The new perennial ryegrasses look just as handsome as the bluegrass, and contribute quick-starting cover. A sampling of the modern cultivars of these favorite seeded lawngrasses is given in Table 1.

The new cultivar explosion has had monumental influence. Only a decade or two ago, there was little or no choice among lawngrasses, even though agriculture had bred select varieties for better yield and improved adaptability for years. Discovery of Merion bluegrass on a Philadelphia golf course about mid-century was an inkling of things to come. Here was a superior Kentucky bluegrass, but one that yielded seed sparingly so that its cost was appreciably higher. Would the public, accustomed to inexpensive lawnseed, pay a premium for quality? Although it seemed questionable at the time, the answer proved to be a resounding "yes."

The floodgates opened. In the South, Glenn W. Burton hybridized bermudagrasses to yield the "Tifton series" now widely planted. And, more adventurous American seedsmen, such as Jacklin with Fyking bluegrass from Sweden, started importing the premier selections of Europe. In the United States, legislation was not passed until late 1970 granting varietal protection to sexually propagated cultivars (i.e. from seed); European countries, profiting from years of such protection, had gained quite a head start in commercial lawngrass breeding. The gap has since closed, and, as might be expected, some of the better cultivars for America come from American stock.

The introduction of new cultivars has turned into a deluge, and it is reshaping turfgrass considerations throughout the country. A wide array of selections is now available, some of them specialized for certain regions or for certain usages, but all of them improvements in one way or another over the common grass of yesteryear. A new cultivar would not be brought to market if it did not show advantages, especially in tolerance to commonplace diseases, low-dense growth well suited to mowed turf, maintenance of genetic quality, and (with northern grasses especially) competitive production of high quality seed.

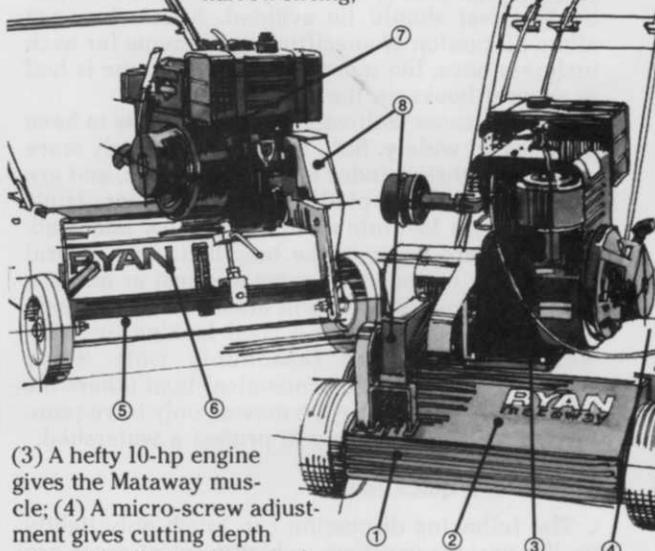
Still newer turfgrass cultivars will be bred, screened, and brought to market as demands of the future are met. In addition to the qualities enumerated, breeding for low-maintenance will receive much attention. Perhaps not too surprisingly, the same cultivars which show well under high maintenance often rate best under low. Expect more emphasis on bred-in insect resistance (disease tolerance has been the primary focus of pest mitigation by breeding so far), drought

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tolerance, recuperativeness, quality (preferably without increased thatching), and so on. If large enough regional markets form, it may even prove feasible to mold cultivars for a particular pH, soil salinity, weather cycle, or similar local peculiarity of the environment.

While turf for parks and recreation runs the gamut from intensively managed golf greens to untended open space, most acreage calls for moderate maintenance. Well-timed seedings to a prepared soilbed can yield turf economically in northerly locations and also in the South with seeded grasses (such as common bermudagrass, and strains of bahiagrass) if they are given a bit of care. Where labor is scarce or unskilled and emphasis is on economy, species requiring intensive management (such as improved bermudas and bentgrasses) should be avoided. Space does not allow discussion of specific requirements for each turfgrass here, but more thorough coverage is had in several books on the subject.

In many cases, cultivars are still too new to have been tested widely. Still, some are obviously more aggressive, thrive under less maintenance, and are especially well adapted to certain regions. Hints for the Lawn Institute's Variety Review Board acceptances are given in the box. Including several cultivars in a blend (the same species) or mixture (more than one species) will almost surely provide potential these days for a good looking turf that wears and survives reasonably well. Some cultivars will be more economical than others for functional turf that may be mowed only infrequently and be meant merely to protect a watershed.

Turf care, a quick review

The following discussion can touch only lightly on the various practices, which in most cases are well known and thoroughly covered in standard advisories. I will attempt in the space available mainly to examine trends as they seem to be affected by the new lawngrass cultivars.

Mowing—By and large, trailing grasses, especially those clipped fairly low (3 centimeters or less), mow most neatly with reel machines. Rotaries are more flexible, and more easily maintained, for the less meticulously kept swards mowed 3 centimeters tall or taller. In general, high mowing is advantageous, the greater amount of green leaf thus retained contributing to vigor, deeper rooting, and better suppression of weeds. Newer cultivars are for the most part selected for more decumbent, denser growth than old fashioned grass, and can be expected to withstand somewhat more rigorous mowing that might be anathema to common sorts. Even so, 50 percent of the green foliage is the maximum that should be sacrificed at any one mowing; clipping should be undertaken frequently enough so as to assure this.

Of course, grass must be mowed to be called a turf, and it is clear that unmowed swards soon give way to weeds and brush. Experience with roadside berms shows that mowing quite tall, even if only a few times during the growing season, is adequate for functional cover, which is not viewed as being unsightly by most people so long as the contrasting

vegetation (broadleaf weeds) is occasionally cleaned out with herbicides. Some new cultivars have been and are continuing to be selected primarily for proletarian uses such as berms and relatively untended open areas.

Weeding—One of the turf "miracles" of the last quarter century has been perfection of selective and preventive weeding. The 2,4-D (phenoxy) group of chemicals provided a breakthrough, in that these highly selective herbicides are lethal to most broadleaf plants (dicotyledons) at rates harmless to grasses. Thus it is not difficult to keep once ubiquitous dandelions, plantains, and similar pests out of turf. The phenoxy chemicals are deleterious to some southern grasses, especially St. Augustine, and in the southlands one should follow recommended local practices (in the South weeds may be a greater problem than in the North because of the longer growing season and the greater diversity of species).

Because of restrictions and costly development, flow of new herbicides to market is not what it was some years ago. A number have been prohibited as being hazardous. Yet, of all pest control measures, weeding with herbicides is most gratifying; it's labor saving, and not damaging to the environment if properly carried out. Silvex and 2,4,5-T have been banned by EPA; however, 2,4-D fortified with dicamba, mecoprop, or other additives serves remarkably well for freeing grass from dicotyledonous weeds. Several effective preemergence chemicals are at hand to stop annual grasses, such as crabgrass, worth the expenditure for prominent swards. Oxadiazon is one of the more recent, effective against goosegrass (*Eleusine*) as well as crabgrass (*Digitaria*).

It is still difficult to remove perennial weed grasses from turfgrass, but glyphosate (and paraquat, on the restricted list) do a nice job of wiping out all vegetation prior to renovating with improved cultivars. Such are some of the labor-saving tools now available for managing turf, as applicable with the new cultivars as with common grass (slight differences in the risk of burn do show among cultivars). Some new cultivars are especially vigorous in fighting their own battles, in the image of Merion bluegrass. Few volunteer grasses or weeds gain entry into a flourishing turf of Touchdown bluegrass, for example.

Irrigation—For arid regions irrigation is essential if first class turf is to be had at all. However, functional cover can often be attained in the western plains with secondary species such as buffalograss (*Buchloe*), gramagrass (*Bouteloua*), and wheatgrass (*Agropyron*), with little or no watering. Even in humid climates where rainfall is usually ample, irrigation is nowadays demanded for more important turf plantings in order to keep them lushly green no matter what the weather. This is especially true for golf courses and athletic fields which must be ready for play "rain or shine." Installation or irrigation systems has become a highly specialized engineering operation. Most are underground, and many are equipped with automatic controls.

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Except in arid climates, watering is not often the limiting factor to good turf, as is often assumed. From the standpoint of the grass, occasional drying out may actually be therapeutic. Cyclic drying can help thwart diseases and weeds, and will likely encourage deeper rooting. All too often there is a tendency to overwater once provision is made for irrigation. If nothing else, water-

loving weeds such as *Poa annua*, volunteer bentgrass, and various sedges are then encouraged at the expense of the grass (few grasses are naturally adapted to a constantly soggy soil).

At the height of the growing season most turfs lose only about an inch of water per week through evaporation and transpiration. This is the quantity of water that should be

replenished in a common sense fashion (i.e. at rate of application and in quantity tailored to the local soil's insoak and water-holding capacities). In general, sandy, porous soils need light watering each few days, while heavy, clay-silt soils merit slower, more prolonged watering. Diseases are generally encouraged by dampness, although one of the measures for countering *Fusarium* is to irrigate moderately. The new cultivars, most of them with bred-in disease tolerance, are likely to be pretty flexible as to watering schedules.

Differences in irrigation preferences are fairly marked between species, although not greatly different between cultivars within a species. Fescues are well-adapted to dry conditions, especially in hot weather; bluegrasses and perennial ryegrasses are broadly tolerant, but "prefer" good drainage; bentgrasses are at home with high humidity and frequent watering. Bermudagrasses respond well to generous watering because of their vigor and rapid growth. Indeed, most southern species have evolved in humid environments so they "appreciate" some irrigation, especially on soils of the sandy coastal plain and in the arid Southwest.

Fertilization—Judicious use of fertilizer is one of the most effective means for encouraging turf (thus discouraging weeds), and enhancing the attractiveness of the lawn. Fertilizers rich in nitrogen are appropriate for a foliage-producing plant such as lawngrass. Most of the time a complete fertilizer (one containing all of the major nutrients — nitrogen, phosphorus, and potassium) is utilized. Potassium is increasingly recognized as important for winter hardiness, general resistance to disease, and sturdy growth. Phosphorus promotes root growth, especially in seedling grass, and helps grass achieve a jump on familiar weeds. Almost invariably nitrogen will be needed in any fertilization program, and a soil test can give guidance as to the necessity for other nutrients.

Simple pH determinations reveal acidity and the need for lime. Lime is often advantageous in regions of heavier rainfall, such as the eastern United States. In recent years sulphur has promoted grass health and retarded weed invasion (noteworthy of *Poa annua*), especially in the Pacific Northwest and

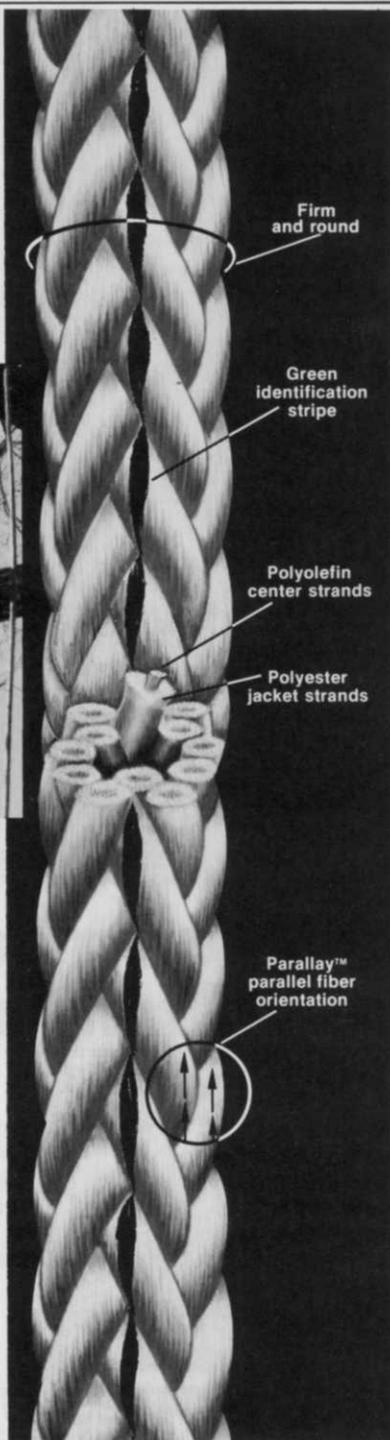
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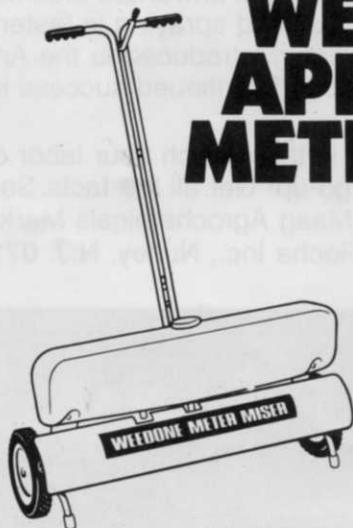


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Turf Selection

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in Florida. In general, the newer cultivars are more responsive to fertilization than is common grass, the majority of them having been bred and selected for a regimen of care that included fertilization. Moreover, the newer cultivars are on the whole more resistant to disease, so there is not the worry about hot weather forcing (from fertilization and watering) that often wreaks havoc with common grass.

Southern lawns are typically fertilized at spaced intervals throughout the growing season, usually at rates of about one pound of nitrogen to the thousand square feet on each occasion. At one extreme is bermudagrass, a heavy feeder, the other centipedegrass (and perhaps bahia) which resents heavy fertilization. The other southern species fall in between; by and large they perform better and have better color if regularly fertilized. In the North, creeping bentgrasses are perhaps most in need of fertilization among modern lawngrasses, with fescues least demanding. Bluegrass and perennial ryegrass look better when adequately fertilized, and some difference shows up between bluegrass cultivars (Merion, for example, is a heavy feeder, while several other cultivars seem to survive quite well on a light regimen).

The advantage of autumn and early winter fertilization with northern grasses has been recognized in recent years, with only light feeding recommended as spring progresses. In the southern portions of the bluegrass belt, about two-thirds of the fertilizer may be applied in autumn, rather little during the summer (it would benefit weeds then, and perhaps encourage disease with common bluegrass). Even in northern portions of the bluegrass belt advantage is seen from late season fertilization.

Soil Manipulations - When preparing the soilbed, whether for seed or sod, advantage should be taken of the opportunity to introduce needed nutrients while the soil is being cultivated. Heavily used turf may merit incorporation of amendments, such as high percentages of sand to facilitate drainage, calcined clay, organic materials to bolster aggregation, and so on. In the majority of cases, however, soil treatments other than the mixing of fertilizer are too costly, and a good stand of grass is generally obtainable merely through

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fertilization, sensible mowing, and perhaps watering if needed.

All grasses tend to improve soil as they grow in it, fingering rootlets that are partly recycled each year throughout the top several inches. On some hydrophobic soils wetting agents may help to keep the rootzone moister, or on water-logged ground to facilitate drainage. Applications of sulphur or gypsum may help control iron chlorosis of grass, on alkaline soils of the West high in sodium. Ground limestone for acid soils, and sulphur for highly alkaline ones, are familiar means for adjusting pH (most grasses do best in a mildly acid to neutral medium; bent-grasses and centipede grasses are adapted to more acid conditions, and all species are rather broadly tolerant).

Other Perquisites - The main attentions that generally spell success for turf have been highlighted. Yet special problems do occur, and some are receiving no little attention.

Irrigation water is becoming increasingly expensive and is not always of the highest quality. In the Southwest, particularly, salinity

problems arise. Alkalagrass (*Puccinellia*) and saltgrass (*Distichlis*), are adaptations from the plains which withstand relatively high salinity. The species are not competitive where other grasses flourish. Even among the conventional lawn-grasses slight differences among species and cultivars show up in ability to withstand saline environments (in California, for example, Fyking showed superior salinity tolerance among bluegrasses).

Thatching of lawns is a modern problem, in which undecomposed tissues accumulate at the base of the sod. Zoysia is notorious for being slow to disintegrate, while in the North fine fescue is more resistant than bluegrass or perennial ryegrasses. With all species, vigorous cultivars produce more vegetative growth (potential thatch) than less aggressive ones. Thatch-formation is influenced by many factors, but in general biological agents have not increased thatch decomposition. A moist thatch environment, as under a light topdressing, of soil, is usually most effective for reducing thatch. The newer cultivars will probably

build up thatch a bit more rapidly than common grass, simply because they are dense and vigorous. Occasional dethatching at a season when quick recovery will occur may prove helpful.

Aerification is advocated for compacted soil. Coring, in which pencils of soil are removed, rather than spiking, during which indentations are made, is generally preferable. It creates avenues for insoak of water and nutrients. The core holes often fill quickly with roots, indicative of favorable oxygenating conditions.

Pesticide treatments were mentioned under weeding, and, of course, extend to insects, fungi and nematodes (eelworms). Impressive new products come to market from time to time, helping to offset buildup of pest resistance to older pesticides. As was mentioned, bred-in pest resistance seems the wave of the future with lawngrasses. A groundswell of interest in integrated pest management (IPM), in which natural controls as well as pesticides play a major role, is also evident.

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