

The Landscape Management
**GUIDE TO
OVERSEEDING**

Overseeding requires careful planning and seed selection, and correct seedbed preparation to increase the likelihood of success.

L. B. McCARTY, Clemson University

Bermudagrass growth stops when temperatures drop below 60° F and discoloration (browning) can be expected if temperatures drop below 50° F for an extended period. Warm-season grasses such as bermudagrass and zoysiagrass, therefore, are often overseeded with cool-season grasses during the fall and the winter to provide a green playing surface with desirable color and better traffic tolerance. In addition, golf course fairways sometimes are overseeded to clearly mark suggested landing areas for golfers.

Overseeding grasses compete very aggressively with the bermudagrass until air temperature consistently reaches the high 80° F. This competition typically delays total green-up and

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fill-in of the bermudagrass and if the overseeding quickly dies, the bermudagrass stand generally is thin.

If an area is overseeded for only one year, it will normally take another two years for all of that overseeding seed to totally germinate. Therefore, courses will have reoccurring sporadic overseeding for up to three years after the last overseeding year. Escaped clumps ('renegade' ryegrass) of overseeding from the intended seeded areas also are unsightly, difficult to mow, difficult to eradicate, and often live into mid-summer.

Overseeding also is argued to reduce weed population due to the competition. This is rarely the case and in fact, overseeding usually slowly increases weed pressure. This is especially true for annual bluegrass which typically becomes a serious weed problem when courses overseed continuously for a number of years. This seed is then easily tracked onto green and tee surfaces, thus, increasing its occurrence in these areas.

Timing considerations

Seeding too early can result in excessive bermudagrass or zoysiagrass competition and the increased likelihood of diseases such as *Pythium* blight. Seeding too

late in fall may result in weak, delayed or reduced seed germination because of low temperatures.

Optimum overseeding time is when late summer/early fall night temperatures are consistently within the 50° F range. Or when soil temperatures at a four inch depth are in the mid-70's, or the average midday air temperatures remain in the low 70's. Cool-season grass seed germination is favored by temperatures between 50° and 70° F. Time overseeding at least 20 to 30 days before the first expected killing frost.

Three to six weeks prior to overseeding

1) Reduce or stop nitrogen fertilization three to four weeks prior to overseeding to minimize competitive bermudagrass growth. Excessive growth at the time of overseeding will provide competition for the germinating seed and predisposes the grass to winter injury.

2) Cultivate the soil by coring four to six weeks prior to overseeding. Allow the cores to dry and pulverize them by verticutting, power raking or dragging. Coring is performed in advance of the actual overseeding date to allow coring holes to heal over, thus preventing a speckled growth pattern of winter grass.

The overseeded grasses typically grow faster with a darker green color in and around cores holes.

3) Following coring, verticut in several directions to reduce thatch and to open the soil surface to allow better soil-to-seed contact. Remove verticut debris by raking, blowing or mowing with catcher basket attachments. Depth of verticutting depends primarily on the depth of thatch. Thicker thatch layering requires deeper verticutting. Other factors, such as algae formation, however, may dictate how severe this verticutting is. If algae is a problem, light, frequent grooming may substitute for verticutting greens.

4) Topdress with approximately ½-cubic yard per 1000 square feet following the removal of the verticut debris. This provides a smooth seedbed and minimizes effects of the remaining thatch. Most consistent results occur when the seedbed is topdressed before and immediately after overseeding to provide desirable soil contact. Use desirable topdressing mix; e.g., contains <10 percent of particles small than 0.1 mm and none above 1 mm in diameter.

5) Apply phosphorus (P₂O₅) and



Overseeding provides desirable year-round color, some protection to the permanent grass, and suggested landing areas for players.

Advice & supply outlook from suppliers

LM: What facet of the golf course overseeding process is most important to the success of a project?

► "Sometimes superintendents will choose a poor quality mixture, maybe with higher fluorescence or contaminants that result in a lower price. And the superintendent, to meet budget requirements, cuts it too thin. In some cases they'd be better off using 5 percent less seed than going for a 5 percent cheaper price. The newer varieties have much better color and density and as a result of their better genetics they're more difficult to control in transition without using chemicals.

—John Zajac, Zajac Performance Seeds

► "Initial seed establishment is critical. Timing, procedure and seed quality are all most important. Poor quality seed of inferior varieties will show poor results all year long. Once poor quality seed is planted, there is no going back.

► "Timing is also very important.

Seeding too early will cause high seedling mortality due to disease, competition and heat stress. Planting too late means an incomplete establishment. At Pickseed, we custom blend and mix seed to our customers specifications. We use only top quality seed of good varieties. We are available to assist and answer any questions or problems as they arise.

—Dr. Jerry Pepin, Pickseed West

► "All perennial ryegrasses will germinate quickly. In overseeding, when downtime equals money, rapid tillering and establishment are important.



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potassium (K_2O) at a suggested rate of 10 pounds of 0-9-27 (or equivalent) per 1000 square feet, or at the rate suggested by a soil fertility test. Test the soil about four weeks prior to overseeding. Phosphorus and potassium enhance overseeding rooting without promoting excessive bermudagrass or zoysiagrass top growth.

10 to 14 days prior to overseeding

1) Approximately 10 days to 14 days prior to overseeding, reduce the mowing height and verticut lightly in two directions (just touching the soil surface) to open the turf and to allow the seed to fall into the turf canopy. This practice provides good seed-to-soil contact, minimizes wind and water from carrying seed away, and provides sufficient time for verticut slits to recuperate before overseeding.

2) Next, use a power sweeper, a mower with basket attachments, or blower to remove remaining debris, and then irrigate thoroughly.

3) On sloped areas, if possible, discontinue mowing two or three days prior to overseeding, or raise the mowing height $\frac{1}{4}$ or $\frac{5}{16}$ inch one week prior to overseeding to provide an upright framework of grass to prevent seed from washing.

4) Spiking or slicing in several directions just prior to seeding also enhances seed-to-soil contact. Care, however, might be taken to evenly distribute seed without concentrating it in spiked holes to prevent a speckled appearance.

Overseeding with small-seeded species such as fine fescue or *Poa trivialis* often does not require as extensive seedbed preparation as larger seeded grasses like ryegrass. However, some seedbed preparation is needed for all species with the last two steps listed above being minimum requirements for all overseeding. The greater the thatch layer and the use of larger seeded species require more seedbed preparation.

Preparing fairways

Fairways require an aesthetically pleasing appearance but are not prepared as intensely for overseeding as greens and tees are. However, preparation is needed



Overseeding seedbed preparation involves various degrees of aerifying, verticutting, and topdressing to reduce soil compaction, discourage bermudagrass competitive growth, reduce thatch, and provide good seed-to-soil contact.

to provide for uniform germination and overseeded grass establishment.

1) Mow the base grass very close just prior to overseeding and pick-up clippings and debris. This also will open up the turf and will allow seed to reach the soil, provided thatch is not a problem.

2) If thatch is a problem, core several weeks in advance of overseeding. Break up dried cores by dragging a piece of chain link fence or a flexible metal mat over the surface. Soil from this coring also provides a good germination media for the overseeded grass.

3) Excessive fairway thatch may require verticutting in conjunction to close mowing and coring prior to overseeding.

Perennial ryegrass

Perennial ryegrass has been the preferred overseeding grass. It germinates fast (typically five to seven days), has a fine leaf texture, dark green color, seedling vigor, and better disease and traffic resistance than annual ryegrass. Perennial ryegrass also provides a highly desirable striped appearance when mowed in alternating directions.

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Last fall, we saw distinct differences between perennial ryegrass varieties in their ability to tiller the three to four weeks after planting.



At that stage of establishment, Charger, Charger II, Sunrye (246), Roadrunner and Citation III are the first varieties to partition energy into stems for seed production. This weakens the plants, making them susceptible to high temperatures which start the spring transitioning process."

—Crystal Rose-Fricker, research director, Pure Seed Testing West.

► "Buy your seed off a test, not just a tag. A purity test will indicate the presence of *Poa annua* in a lot where an analysis tag may not. Some



Annual (Italian) ryegrass

Annual ryegrass (*Lolium multiflorum*) has lost some of its importance in recent years as an overseeding grass since it produces a coarser, more open turf than many newer turf-type perennial ryegrasses and is extremely susceptible to pythium diseases. Annual ryegrass has poor heat and cold tolerance and often experiences early spring death which may result in poor seasonal transition. It dies quickly when a few warm days occur in early spring. This may result in thin spots where the bermudagrass has not had time to fully green-up and cover any weak areas. Annual ryegrass germinates quickly and is acceptable on fairways and other general use areas where color and appearance are not of greatest concern, or when budget constraints are important. Few improved turf-type cultivars of annual ryegrass are currently available.

Forage-type cultivars include Astor, Gulf, Magnolia, and Wimmera.

Intermediate ryegrass

Intermediate ryegrass (*Lolium hybridum*) is a hybrid of annual and peren-

nial ryegrass. Like annual ryegrass, intermediate ryegrasses germinate quickly but lack heat tolerance. Intermediate ryegrass makes a sharper transition than the turf-type perennial ryegrasses. Intermediate ryegrasses also have a medium texture, a lighter green color and reduced shoot growth. Due to its heat intolerance, intermediate ryegrasses disappear quickly as bermudagrass begins to grow in the spring. They do not retard bermudagrass as much as more heat tolerant turf-type perennial ryegrasses. Higher budgeted fairways are the main use areas of intermediate ryegrass. Several varieties of intermediate ryegrasses are available, including: Agree, Froghair, Midway, Oregreen, Savvy, and Transtar.

Fine fescue

Fine fescue is a general term used for several fine-leaved *Festuca* spp. that have delicate and wiry leaves that are usually less than 0.5mm wide and have a clumping, bristle-like appearance. Red fescue (*F. rubra* L.) and spreading fescue (*F. pratensis* Huds.) have slow spreading rhizomes while chewings fescue (*F. rubra*

CHARACTERISTICS OF SELECTED GRASSES USED FOR WINTER OVERSEEDING.

Grass Species	Perennial Ryegrass (turf-type)	Annual Ryegrass	Intermediate Ryegrass	Fine Fescue	Roughstalk Bluegrass (<i>Poa trivialis</i>)	Creeping Bentgrass
Green Color	Dark	Light	Intermediate	Light-Dark	Light to intermediate	Intermediate
Texture	Med.-Fine (2-4mm)	Coarse (3-5mm)	Coarse-Med. (3-4mm)	V. Fine (1-2mm)	Fine (1-4mm)	V. Fine (1-2mm)
Density	Good	Poor	Fair	Excellent	Excellent	Excellent
Establishment Rate	Fast (3-4 weeks)	Very Fast (2-3 weeks)	Fast (2-4 weeks)	Slow (4-6 weeks)	Slow (4-6 weeks)	Very Slow (6-8 weeks)
Winter Performance	Good-Excellent	Fair-Good	Fair	Fair	Fair	Fair
Spring Performance	Good-Excellent	Poor	Fair	Good	Excellent	Fair
Spring Transition	Slow	Medium	Medium	Fast	Fast	Slow
Wear Tolerance	Fair-Excellent	Poor-Fair	Fair-Good	Fair	Poor	Fair
Shade Tolerance	Fair-Good	Fair	Fair	Very Good	Good	Fair
Putting Quality	Fair-Excellent	Poor	Poor-Fair	Good	Excellent	Excellent
Competitiveness with <i>Poa annua</i>	Very	Very	Very	Not Very	Not Very	Not Very
Leaf Fraying	Moderate -minimum	Heavy	Moderate	Minimum	Minimum	Minimum
Disease Resistance	Fair-Good	Poor	Fair	Fair	Poor-Fair	Fair

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states do not require that *Poa* be listed on a tag. A reputable dealer will provide the purity paperwork of a given lot on request."

—Duane Klundt, national sales manager, Turf-Seed

► "Pre-planting preparation is critical. Also important is the timing of the overseeding. If the area is overseeded at the wrong time, the results will be poor. Disease control during the grow-in process is also important."



—Dr. Richard Hurley, executive vice president, Lofts Seed

► "Preparation steps are extremely important. Adherence to the preparation process during overseeding is critical. The timing of the seeding, fertilizing and mowing directly affect the success of the overseeding procedure."

—Joe O'Donnell, manager, Sunbelt Seeds branch of Lofts Seed.

► "Never buy VNS (variety not stated). If the variety—or varieties in a blend—are not stated on the seed analysis tag, anything could be in that bag. Unnamed ryegrasses could be low-quality imports, uncertifiable buffer strips from production fields, or pirated products that bypass turf breeders' royalties. These may be sold for a few pennies less a pound than named cultivars that pass through the quality checks imposed by certification and reputable marketing companies.

► "Order early to get the one that will work best on your course. Although it's difficult to ascertain availability until the crop is 'in the barn,' marketers like Turf-Seed, with their own research arm to predict yields, veteran contract growers and fieldmen to keep production standards high and established distributor/dealer network to get the



Seeding should be made in several directions to ensure uniform application. A drop spreader is also used to define the perimeter of the overseeded area.

ssp. *commutata* Gaud.), sheep fescue (*F. ovina* L.), and hard fescue (*F. longifolia* auct. non Thuill.) have a bunch-type growth habit. As a group, the fine fescues are noted for good shade tolerance, low-mowing height tolerance,

goods to market, will come through for the winter overseeding market year after year."

—Tom Stanley, marketing manager, Turf-Seed

► "The single most limiting factor of overseeding is the condition of the dormant warm-season turf! If your foundation of warm-season grasses is good, you will be successful in a long-term overseeding program. Seedling establishment and transition will benefit from a healthy base of warm-season grass. For example, if you have 'Indian Summer,' and the course requires more renovation, verticutting and aerification than normal, the long term detrimental effects on turf quality as a result of this change in management practice are minimal. Applications of the growth regulator Primo or late season use of desiccants such as Reward

winter hardiness, and adaptability to infertile and dry soil conditions. They do not tolerate heat or wet, poorly drained soils well but are particularly adapted to dry, shady conditions as well as to low-maintenance situations. Fine fescues rarely are used alone for overseeding but are usually mixed with other cool-season grasses such as perennial ryegrass, and bentgrass. Fine (red, chewings, or hard) fescues, particularly chewings fescue, provide a fine texture, and a stiff, upright growth habit which increases fall putting speeds. Density is good to excellent, but establishment rate is moderate. Fine fescues, as a group, provide good spring transition. They should not, however, be used if the herbicide ethofumesate (Prograss) is to be applied for annual bluegrass control. Fine fescue normally is used as a mixture with perennial ryegrass to improve desirable characteristics of a putting surface.

Bentgrass

Because of its fine texture and low growth habit, bentgrass often is used to provide a permanent or temporary overseeded putting surface. Bentgrass (especially, Seaside and Mariner) also has good salt tolerance. However, bentgrass is slow

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may be in the cards. These tools have little detrimental effect on a healthy base of warm-season turfgrass.”

—Craig Edminster, International Seeds

▶ “Optimum seedbed preparation and the initial two feedings; a thatched or verti-cutted warm-season turfgrass stand; exposed areas for best soil/seed contact. The first two feedings within six weeks establishes over-seeded ryegrasses for optimum coverage.”

—Zenon Lis, agronomist/marketing manager, Burlingham Seeds

▶ “The most important step in the overseeding process is choosing the right seed. We understand perfectly well that the steps such as dethatching, aeration, fertilization, irrigation, etc., are extremely important...but even with the best preparation and all the hard work a superintendent puts into overseeding, the results will not be up to par without top quality seed.”

—Ronnie Stapp, executive vice president, seed operations, Pennington Seed

- ▶ 1/ Variety selection,
- 2/ Purity of seed,
- 3/ Site preparation,
- 4/ Timing

“Any of these things done wrong can cause problems. Hit them all right and you’ll be successful.”

—Stephanie Ward, Seed Research

▶ “At TMI, we believe the most successful thing we can do for our superintendents and other landscape professionals is to have our high quality seed at their doorstep when they need it. Since the weather can be most fickle, if the conditions are right, the overseeder must move quickly to get the seed down, and he/she can’t do it if the seed is still in Oregon somewhere waiting for someone to ship it! TMI has a most exceptional record for on-time deliveries of premium seeds...”

—Steve Tubbs, Turf Merchants, Inc.

TURF-TYPE PERENNIAL RYEGRASS CULTIVARS

Cultivars: Accent, Advent, Affinity, Allegro, Alliance Brand, All Star, Assure, Barredo, Barrage, Barry, Belle, Birdie I-II, Blazer, Brightstar I-II, Caddieshack, Caliente, Calypso, Catalina, CBS II blend, Celebration Blends, Chaparral, Charger I-III, Citation I-III, Commander, Competitor, Cowboy, Cutless, Dandy, Danaro, Dasher I-II, Delray, Derby, Diplomat, Duet, Elegance, Elka, Equal, Essence, Excel, Express, Fiesta I-II, Gator, Gettysburg, Goalie, Lindsay, Linn, Loretta, Low Grow, Manhattan I-III, Navajo, Nobility, Nomad, Omega I-III, Ovation, Palmer I-III, Panther, Patriot II, Pebble Beach, Pennant II, Pennfine, Pinnacle, Pleasure, Prelude I-III, Premier, Quickstart, Regal, Repell I-III, Riviera, Roadrunner, Rodeo II, Saturn II, Seville, Sherwood, Shining Star, Stallion, Stardance, Sunrye (246), Surprise, Symphony, Tara, Target, Toronto, Troubadour, Wizard, Yorktown I-III

Comment: More than 200 cultivars of perennial ryegrass are available and this list is very dynamic. When used for overseeding, newer cultivars have better heat and disease tolerance, therefore, may remain longer into the summer season than desired.

to establish and is susceptible to many diseases. In addition, it is usually slow to transition in spring when compared to most other grasses used for overseeding. In warmer regions, the lack of extended cold temperatures may allow the bermudagrass to stay competitive throughout the winter. This may result in small, immature bentgrass seedlings that tolerate traffic poorly and are more susceptible to diseases and to over-watering.

If a bentgrass is used for overseeding, Redtop (*Agrostis alba*) is more vigorous, less expensive, and less competitive in the spring. Numerous bentgrass varieties

have been introduced in the last decade. ***Poa trivialis* (roughstalk bluegrass)**

Poa trivialis (often called roughstalk bluegrass, rough bluegrass, or ‘Poa triv’) has a fine texture, good density, and is more cold tolerant than ryegrass). This is due, in part, to its high seed count, at approximately 8-to-1, compared to perennial ryegrass. This gives it a greater density in the number of seed per square foot than ryegrass. It is easier to establish in the fall compared to ryegrass since radical increases in mowing heights are not necessary and golfers like it due to minimum seedbed preparation needed for establish-



Annual bluegrass (*Poa annua*) is the most troublesome weed problem in overseeded areas due to its prolific seedhead production, clumping growth habit, and early spring die-back.



Perennial ryegrass (right half) compared to annual ryegrass (left half) used for overseeding.

ment. Roughstalk bluegrass also tolerates poorly drained soils and has good shade tolerance. These characteristics make it desirable as a component of an overseeding mixture (typically 15 to 30 percent) with perennial ryegrass or with bentgrass. However, *Poa trivialis* is susceptible to diseases, especially dollar spot. It has poor wear tolerance and a natural yellow-green color. Hot spots, or dry areas, may develop and require daily hand syringing. It also tends to die-out earlier in the spring than most other overseeding grasses due to its low heat tolerance. This low heat tolerance normally is desirable since spring transition is quicker and smoother. However, extended warm weather into the fall and early warm weather in the spring may prematurely weaken it. *Poa trivialis* also is susceptible to damage when Prograss herbicide is used for annual bluegrass control. Numerous varieties of *Poa trivialis* are currently being developed and released. Improved cultivars include Colt, Cypress, Darkhorse, Laser, Laser II, Polder, Polis, ProAm, Sabre, Sabre II, Snowbird, Star Dust, and Winterplay.

Poa supina

Recently, *Poa supina* Schrad. has been evaluated as a potential species in overseeding and as a permanent turf. *Poa supina* is native to the European Alps. It has short stolons, short internodes, resistance to many diseases, and has good wear and shade tolerance. Like *Poa annua*, *Poa supina* has a very short or restricted root system, requiring frequent, light watering, possesses poor drought tolerance, is persistent, and often invasive. For these reasons, *Poa supina* is not recommended unless shaded conditions do not allow other grass species to persist. Supranova is an available cultivar.

Blend and mixes

Blends (two or more cultivars of the same grass species) of perennial ryegrass, or mixtures (two or more cultivars of different grass species) of bentgrass and *Poa trivialis* (roughstalk bluegrass), or mixtures of perennial ryegrass and fine fescue

BENTGRASS CULTIVARS USED FOR GOLF COURSE PURPOSES

(note: check with you seed supplier and state turfgrass specialist for the latest recommended cultivar(s) for your particular area and needs).

CREEPING BENTGRASS (*Agrostis palustris* subsp. *stolonifera* L.)

Cultivars: Penn A & G Series (A-1; A-4; G-1; G-2; G-4; G-6), Backspin, Carman, Cato (Syn 4-88), Century, Cobra, Crenshaw (Syn 3-88), Dominant (SR1019 + SR1020), Emerald, L-93, Lopez, Mariner, National, Penncross, Penneagle, Pennlinks, ProCup, Prominent, Providence (SR1019), Putter, Regent (Normark 101), Seaside, Southshore, SR 1020/1119, Trueline, Viper

Comment: Bentgrass used alone for overseeding purposes generally perform poorly as they establish very slowly and then compete aggressively with the bermudagrass during transition. Blends with *Poa trivialis* or fine fescue generally perform better than pure bentgrass. This list is very dynamic as new varieties are continually being released and others discontinued.

COLONIAL BENTGRASS (*A. tenuis* Sibthorp)

Cultivars: Allure, Astoria, Bardot, Barostis, Boral, Egmont, Exeter, Heriot, Highland, Holfior, SR7000/7100, Tendenz, Tracenta

Comment: These are bunch grasses that tend to grow more upright and require less water and fertility than creeping bentgrass. They generally do not tolerate close mowing as well as creeping bentgrass. They have been used mostly as a component of mixtures for fairways and general turfgrass areas in coastal areas of the Pacific Northwest, Northeast, and northern Europe (summer temperatures less than 85 F). Newer cultivars may prove better adapted to other regions and other uses.

VELVET BENTGRASS (*A. canina* subsp. *canina* L.), Dryland or Highland Bentgrass (*A. castellan*), Brown top (*A. capillaries*), Red top (*A. alba* L.)

Cultivars: Acme (velvet), Barracuda (red top), BR 1518 (dryland), Egmont (brown top), Kernwood (velvet), Kingston (velvet), Piper (velvet), Raritan (velvet), Sefton (brown top), SR7200 (velvet), Streaker (red top)

Comment: These produce some of the finest textured turfgrasses used for putting surfaces due to upright growth habit and dense stand. However, due to lack of heat, disease, and traffic tolerance, they are used mostly in upper New England and the Pacific Northwest, New Zealand, Australia, and in other places as a part of blends. Velvet bentgrass is also noted for its shade tolerance. Red top establishes quickest of the *Agrostis* species and performs well on wet, poorly drained sites.

IDAHO BENTGRASS (*Agrostis idahoensis*)

Cultivar: GolfStar

Comment: A new turf species, Idaho bentgrass has a fine texture, upright leaves, dark-green color and non-creeping (bunch-type) growth habit. Useful for winter overseeding or as a low maintenance permanent turf in fairways or roughs.

are commonly used as a measure of protection against disease and environmental stresses. They also are used to enhance fine texture and smoothness. Mixtures typically consist of 70 percent to 90 percent perennial ryegrass, 20 percent to 30

percent fine fescue and 20 percent to 30 percent *Poa trivialis*. If spring transition is a problem, reducing or eliminating the ryegrass component may be considered. An 80 percent fine fescue and a 20 percent roughstalk bluegrass (by seed

▶“The most important facet is quickness, in two respects: the seed has got to get to the distributor or golf course as soon as it has been cleaned to tournament quality in the Fall. The other most important key to success is getting a perennial ryegrass that can establish itself very rapidly. Many ryegrasses, while showing good color, do not have a quick enough green up. We feel that breeding work that concentrates on quick establishment while maintaining good color is the most important facet of any golf course superintendent’s success in overseeding. Coupled with fast establishment, we focus on all the common disease resistance traits that many turf seeds lack.”
—Cory Sonnen, Western Productions, Inc.

LM: What can you tell LM readers about the availability of overseeding varieties for 1998?

▶“There is virtually no carryover going into new season. With carryover comes mixing, blending, harvesting to make the supply window. This year we have less inventory to start the season. Supply continues to meet demand.

▶“Our Confidence and Leaderboard blends should be pretty good once they are cleaned, mixed and blended.

▶“A new ryegrass called Bullet is an easier to transition ryegrass that will be available in the fall.”

—John Zajac, Zajac Performance Seeds

▶“Availability in 1998 should be good. Our supply of Darkhorse *Poa trivialis* will be much better. Due to problems at the Oregon State University Seed Lab it will be very difficult to have certified blends and mixes available early in the year. The seed laboratory is a real ‘bottleneck’ to seed certification early due to its lack of capacity.”

—Dr. Jerry Pepin, Pickseed West

▶“We are pleased to see a really good use of turf-type perennial rye this year. The supply of seed was very adequate

for a strong demand, but we are selling out on most of our top varieties. The acres are there, in Oregon, for an adequate supply again, but with the strange El Niño-driven weather we have experienced, the yields may not be up to par. We expect to have a good supply of our Morning Star, Shining Star and Wind Star perennial ryegrasses. Our supplies of our newest varieties, Wind Dance and Sonata, will be less than anticipated.

▶“We have a nice production acreage of Winterplay *Poa trivialis* which looks good presently, but as fickle as *Poa trivis* are, we will have to wait and see.

▶“We expect usage of perennial rye and *poa trivialis* to grow again this year. As a result, the demand for seed will be strong and the expected supply should be about equal to last year.”

—Ronnie Stapp, Pennington Seed

▶“Our Symphony and Celebration perennial ryegrass blends have had a tremendous acceptance in the trade. Professional turf managers have truly been amazed at the turf color in Burlingham’s lineup. We’ll have adequate supplies for fall.”

—Zenon Lis, Burlingham Seeds

▶“In the perennial ryegrass category, we have good supplies of: Top Hat; R2; Essence; Derby Supreme; PhD; and Gator II. Our supply of Sabre II *Poa trivialis* is good. Our Tiger colonial bentgrass supply is also looking good.

“In the creeping bentgrass department, our Viper and CEO supplies are good; Cobra supply is tight. We also have good supplies of our overseeding mixtures: PhD with Sabre; Dixie Green with Sabre II; and Showboat.”

—Craig Edminster, International Seeds, Inc.

▶“We expect excellent supplies of our ryegrasses (Palmer III; Prelude III; Repell III and Yorktown III; and Laser *Poa trivialis*).”

—Dr. Richard Hurley, Lofts Seed

weight) mixture will provide a quicker, smoother spring transition. Roughstalk bluegrass also is typically mixed with perennial ryegrass and bentgrass to enhance their performance and to provide a more desirable spring transition. A typical seed weight formula is 85 percent perennial ryegrass plus 15 percent bluegrass, or 60 percent bentgrass plus 40 percent bluegrass. Since no one grass provides all optimum characteristics necessary for overseeding, turf managers often choose different mixtures or blends.

Seed quality

Use only certified (blue tag) seed when selecting species and cultivars for overseeding. Specify maximum percent purity and acceptable germination at the time of purchase. Seed also should be certified as free of hard-to-control weeds such as annual bluegrass.

Request fungicide-treated seed to reduce potential seedling loss due to *Pythium* and *Rhizoctonia* diseases. Metaxyl (Apron), or etridiazole (Koban), are fungicides commonly used for this purpose. Bentgrass used for overseeding nor-

Poa trivialis (left) compared to bentgrass (right). Both have gained in overseeding popularity due to their fine leaf texture, good density, close mowing tolerance, and minimum seedbed preparation needed for establishment. Bentgrass, however, can be slow to establish and transition in spring while *Poa trivialis* can transition quickly in spring but is very susceptible to dollar spot disease.



SUGGESTED OVERSEEDING RATES FOR VARIOUS GRASSES AND MIXTURES (BY SEED WEIGHT) USED ON GOLF COURSES.

Grass	Greens	Tees	Collar/Aprons	Fairways
	lbs. per 1000 sq.ft.-lbs/acre			
Perennial ryegrass	25 - 40	15 - 20	10 - 20	250-450
Italian (Annual) ryegrass	35 - 50	15 - 25	15 - 25	250-400
Chewings (Fine) fescue	25 - 30	10 - 20	5 - 20	—
Bentgrass	2 - 5	2 - 3	2	—
<i>Poa trivialis</i>	8 - 12	5 - 7	4 - 7	—
Typical mixture for enhanced performance and better spring transition: 75% Perennial ryegrass + 25% Chewings fescue				
	30 - 40	10 - 20	10 - 20	150-250
Typical mixture for enhanced performance and better spring transition: 75% Perennial ryegrass + 25% <i>P. trivialis</i>				
	30 - 40	10 - 20	10 - 20	150-250
Typical mixture for better performance in shady or wet areas: 60% bentgrass + 40% <i>P. trivialis</i>				
	5 - 7	3 - 4	2 - 4	—
Typical mixture for widely adaptable to poorly drained or shady areas: 60% <i>P. ryegrass</i> + 25% chewings fescue + 15% <i>P. trivialis</i>				
	25 - 30	10 - 15	10 - 15	150-250
Typical mixture for enhanced fall establishment and better spring transition: 80% Chewings fescue + 20% <i>P. trivialis</i>				
	20-25	8-10	8-10	150-200

mally isn't treated with a fungicide. Extra seed (approximately 10 percent) also should be purchased for repairing small areas that may be lost from pests, weather or traffic. Protect all seed from rodents and store in a cool, dry place.

Spring transition

In spring you want a gradual and smooth transition from overseeded grasses back to bermudagrass turf. Dormant bermudagrass shows signs of 'green-up' when soil temperatures reach the 60° F range. Some overseeded grasses, especially the new and aggressive heat tolerant perennial ryegrasses, can

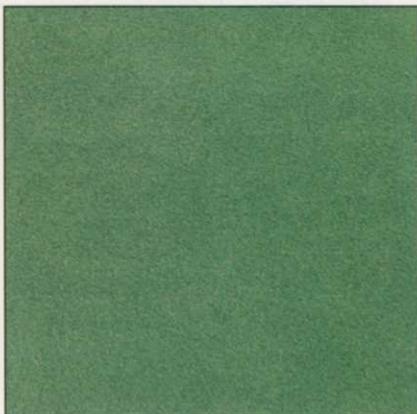
successfully compete with bermudagrass through the spring. This results in a poor transition. Golf greens seeded with mixtures containing bentgrass often experience the same problem. However, on the other hand, mixtures high in *Poa trivialis* or fine fescue are difficult to maintain once temperatures reach the 80° F range. During these times, these grasses become very sensitive to management practices designed to encourage bermudagrass recovery. As early spring approaches, a cultural program is initiated using lower mowing heights, brushes, topdressings and the use of other reel implements such as grooved rollers. The following procedures have proven beneficial in encouraging bermudagrass at the expense of overseeded grasses with minimal disruption to the turf:

1) Use the appropriate seed or mixture. Reducing the amount of perennial ryegrass or bentgrass in an overseeding

mixture aids spring transition. Intermediate ryegrass, fine fescues, and roughstalk bluegrass are less heat tolerant and therefore tend to transition earlier than perennial ryegrass or bentgrass. A 75 percent to 85 percent perennial ryegrass plus 15 percent to 25 percent roughstalk bluegrass, or 60 percent bentgrass to 40 percent bluegrass mixture transitions better in spring, yet provides a desirable putting surface. For those greens with good drainage and less traffic, an 80 percent fine fescue plus a 20 percent roughstalk bluegrass provides a quicker, smoother spring transition.

2) Temperatures (both day and night) are the most important criteria influencing overseeding. Time management practices around traditional temperature patterns and short-term weather forecasts. Probably the most important temperature range to remember is that bermudagrass will not aggressively begin to grow until night temperatures consistently reach the mid 60s. Bermudagrass shoots will 'green-up' much sooner, when daytime temperatures reach the mid 50s. Members become excited with

Intermediate ryegrass is a hybrid of annual and perennial ryegrass. Intermediate ryegrass germinates quickly but lacks heat tolerance and often has a light green color.



AIR AND SOIL TEMPERATURES (° F) AFFECTING TURFGRASS GROWTH AND DEVELOPMENT.

Turf Response	Cool-Season Grasses		Warm-Season Grasses	
	Air Temperatures	Soil Temperatures (4-inch depth)	Air Temperatures	Soil Temperatures (4-inch depth)
Suggested for planting	75 to 80	60 to 70	80 to 90	70 to 80
Optimum for shoot growth	60 to 75	—	80 to 95	—
Optimum for root growth	—	50 to 65	—	75 to 85
Low temp. kill possible	—	20	—	25
Shoot growth ceases (min.)	40	—	55	—
Root growth ceases (min.)	—	33	—	35 to 50
Expected spring root decline is triggered	—	—	—	64
Chilling injury possible/dormancy initiation	—	—	50	—
50% bermudagrass kill	—	—	—	18 to 23
50% zoysiagrass kill	—	—	—	12

the first warm spell of the season and this puts added pressure on the superintendent to hasten transition. However, bermudagrass will not aggressively grow (especially laterally) until the high 60s F are consistently reached at night. Don't begin your transition steps until just be-

fore these temperatures are anticipated or bare areas may become exposed and will not recover until temperatures are high enough to favor bermudagrass growth. Also, if a late cool snap occurs and night temperatures drop into the 50s or low 60s, it will require 3 to 7 days of high 60s

for the bermudagrass to grow actively.

3) Begin reducing the mowing height several weeks before the expected spring transition period. Begin in mid-to-late February by reducing the cut height $\frac{1}{2}$ -inch every 2 weeks until a height of $\frac{1}{2}$ -inch or $\frac{3}{8}$ -inch is reached in late March. Maintain a short mowing height until at least 50 percent of the overseeded grass has been removed (e.g., early May). The mowing height might be raised back to $\frac{3}{8}$ -inch as the bermudagrass begins to recover, but should not be raised while the overseeded grass still dominates. A lower mowing height reduces overseeding shading of developing bermudagrass, warms the soil, and inhibits the growth of the overseeded grasses. The use of grooved rollers and brushes also improves the putting surface and helps maintain the overseeded grass in an upright growth habit.

4) Cultivation. Spike approximately three weeks before bermudagrass normally begins to green-up and every week following to enhance soil warming and turf recovery. Spiking also reduces surface compaction and algae growth. Aerify several weeks before expected spring green-up to promote bermudagrass growth by warming the soil and reduce the competition from the overseeded grass. Use small ($\frac{1}{4}$ -inch) tines with good soil moisture. The superintendent and

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► "Supplies will be similar to last year. The crop looks good, but there is not substantial carryover and therefore, the demands for seed early in the overseeding season can again be a concern. It can be difficult to accommodate overseeding demands immediately after harvest."

—Joe O'Donnell, Sunbelt Seeds

► "With the completion of additional cleaning/blending lines this winter, TMI can ship more than a million pounds per day of freshly harvested overseeding grasses to all major overseeding markets. Perennial ryegrass and *Poa trivialis* are processed on a 24-hour basis, and the seed can be shipped truck/rail from the

multiple processing sites. The current production looks excellent, and TMI expects full late July availability of all of its ryegrasses, such as Affinity, Paragon, Allaire II and Manhattan 3, but also July availability of its top-performing *Poa trivis*, Stardust and Cypress."

—Steve Tubbs, TMI

► "Our overseeding varieties Westlawn WP200 permanent perennial ryegrass and Westlawn RSII transitioning perennial ryegrass and SUN-IN blend are in good supply. However bookings have been made against the crop. Newer production fields look clean and tournament quality seed is available. GOOD-EN and WPEZE turf-type tall fescue

club pro should coordinate spring tournaments around aerification times to minimize play disruption.

5) **Fertility.** Maintain low fertilizer application rates in late winter through early spring to reduce overseeded grass growth. Liquid iron will aid in maintaining desirable green color without excessive flush of growth. When bermudagrass growth is apparent, restore fertilizer applications. About two weeks after initiation of spiking, fertilize with 1/2-lb. of soluble N per 1000 square feet to stimulate new bermudagrass growth. Fertilize weekly at this rate until an adequate bermudagrass cover is achieved.

6) **Verticutting.** While overseeded grasses still are actively growing, initiate light and weekly verticuttings to help maintain the overseeded grasses in a upright growth habit which allows increased sunlight and warmth to penetrate through to the soil and thus encourage an earlier and more rapid regrowth of the bermudagrass. Begin verticutting when daytime temperatures are consistently above 70° F. Another method of judging when to initiate verticutting is when the non-overseeded adjacent fairways green-up. This verticutting should be no lower than 1/16 inch below the bedknife. It should cut above the soil surface and remove only surface leaves and not remove or damage bermudagrass stolons. Light verticutting, in addition to aiding the

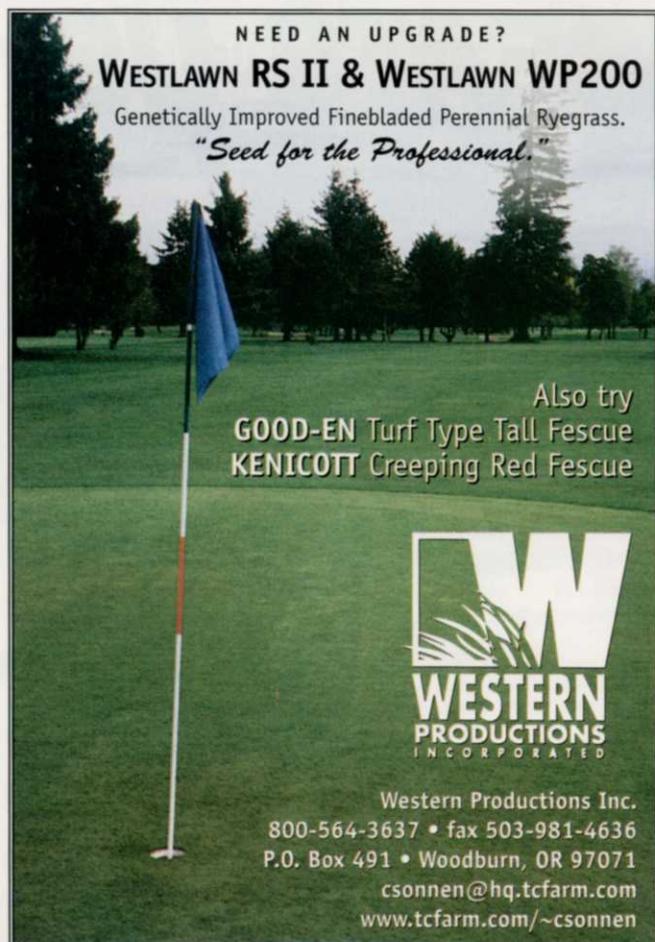
bermudagrass, also will improve the putting quality of greens. Light topdressings on a two to three-week basis at approx. 1/8-yd./1000 sq.ft. also helps maintain a desirable putting surface.

Note: Although traditional light, frequent verticutting and core aerification may promote the gradual transition to bermudagrass, visual turf quality may be reduced until the bermudagrass has had sufficient time to recover. This is especially true if medium to heavy verticutting is implemented. Typically, patches of thin turf form and remain unsightly until the bermudagrass greens-up and fills in.

7) **Maintain adequate soil moisture.** Don't reduce or withhold water in an attempt to encourage the overseeded grass to die from moisture stress. Spring is when bermudagrass suffers from natural decline of older roots and initiation of new ones. Water deeply and infrequently to encourage deep bermudagrass rooting at the expense of the overseeded grass.

8) **Use of herbicides** or plant growth retardants. Selective herbicides have proven useful for slow removal of overseeded grasses in spring. This allows the superintendent better control on transition timing. Herbicide use also provides an earlier indication on how well the bermudagrass wintered and allows more time should re-sprigging or sodding be required. Removal of overseeded grass with herbicides

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GUIDE TO OVERSEEDING

are in moderate supply. Availability should be up from last year. Our new variety of Kenicott strong creeping red fescue which issued in overseeding mixtures is minimal in availability. Improved fine fescue plantings have increased due to availability throughout 1997 and 1998.s"

—Corey Sonnen, Western Productions

► "Our main overseeding products are Champion and Champion G. Q. perennial ryegrass blends. The supply is excellent."

—Stephanie Ward, Seed Research

► Tee time 12-30-7 with Siduron is a combination of the proper nutrients to use on newly-seeded turf or on established turf where overseeding and a pre-emergence herbicide is required. The high phosphorus content provides the nutrient most needed for seedling development and at the same time, will supply enough nitrogen and potash for initial plant growth. At the recommended rates, this product will control annual weed grasses such as crabgrass, foxtail and barnyardgrass into newly-seeded bluegrass, perennial ryegrass and fescue.

—Doug Masters, national sales manager, professional products for The Andersons

(Masters recommends you apply Tee

Time to turf in the spring, prior to expected annual weed grass seed germination. Apply 3.3 pounds per 1000 sq. ft. in newly-seeded areas as the last step before watering. For established turf, apply at 6.6 pounds per 1000 sq. ft. At least one-half inch of water must be provided within three days of treatment.)

► "Availability in 1998 is good! Recommendations for residential lawns: Double Eagle Supreme Blend. For fairways: Eagle Blend. For greens: Double Eagle Supreme Blend. For Florida greens: Pro Am Poa Trivialis Plus Princeville Max."

—Mark E. Laube, product manager, seed LESCO

will also remove the competitiveness and therefore will allow quicker bermudagrass recovery. Control of other weeds, such as *Poa annua*, also is possible with some of the herbicides.

Two to four weeks, depending on temperatures and rates, are typically required to gradually reduce the overseeded grass.

Warmer temperatures and the higher rates usually hasten this conversion. However, a weak stand of grass may result if greens are

treated too soon in spring and if the weather remains cool. Thin turf will remain until temperatures are warm enough for bermudagrass to recover. Research indicates that mid to late-April treatments of Kerb 50W at one lb. product per acre provides the best timing and rate for transition. Visual injury to ryegrass with this treatment lasts from one to three weeks. Pendimethalin applied at five pounds (Pre-M 60DG) in early March also aids in transition but may not be consistent between years. Oryzalin or oryzalin plus benefin (e.g., XL) severely injures ryegrass while oxadiazon, metribuzin (e.g., Sencor) or MSMA doesn't affect transition.

Proceed with caution when using herbicides to enhance transition. Don't begin treatments until several weeks after bermudagrass resumes active growth. Lighter rates than listed may be wise if 'weaker' overseeded grasses such as *Poa trivialis* or fine fescue are present. Sprayer calibration and application uniformity are extremely critical and once the overseeded grass begins to die from the herbicide, there is no turning back.

Plant growth retardants have also been used to help make a smoother spring transition. Mefluidide (Embark 2S) and trinexapac-ethyl (Primo 1EC) have been used in early spring to help discourage the overseeding without retarding the



Clumping of undesirable ryegrass in early spring near golf greens.

bermudagrass green-up. Rates appear important since heavy applications may retard the bermudagrass as well as the overseeding. Primo 1EC at 3 to 4 ounces of product per acre and Embark 2S at 1 quart per acre are the starting point. More research should pinpoint rates in relation to timing of the transition.

Winter management

Maintaining an acceptable turf appearance during winter involves proper watering and fertilization, traffic and disease management. In addition, areas that become damaged or do not provide an acceptable stand after the initial seeding may need more seed. Order an extra 10 percent of seed in the event of thinning.

Irrigate regularly during the winter to prevent plant desiccation. Also, light, mid-day irrigations may be necessary if the overseeded grass begins to wilt. Don't over-water; this may promote algae and disease occurrence.

Traffic control in winter reduces injury to the bermudagrass crowns and stolons. Frequently alternate or change mowing patterns, regularly skip 'clean-up' laps, use walk-mowers, and change pin placement daily.

Nitrogen fertilizer influences the appearance of the overseeded grass and spring recovery of the bermudagrass. Avoid excessive nitrogen to prevent unhealthy grass competition and to prevent

succulent overseeding growth. Nitrogen applications every 2 to 3 weeks with ½-lb. nitrogen per 1000 square feet usually is sufficient. More frequent applications may be needed if the recovery time from traffic or damage from weather is slow.

Applications of phosphorus, potassium, manganese and iron should be considered during winter. All of these provide desirable color without stimulating excessive shoot growth. Also, potassium helps in carbohydrate formation. These elements also prevent grass desiccation. Determine soil phosphorus and potassium levels by soil testing. Iron generally is applied every 3 to 4 weeks as ferrous sulfate at 2 ounces per 1000 square feet. Iron sulfate or a chelated iron source usually can be tank-mixed with most fungicides. Manganese can be applied as manganese sulfate at ½- to 1-oz. in 3 to 5 gallons of water per 1000 square feet.

Its occurrence usually is suppressed with sufficient nitrogen levels. Brown patch and pythium blight generally are the exception and not the rule for today's overseeded grasses. Greens, however, which drain poorly or suffer continuous wet periods, can trigger outbreaks of these diseases. Excessive amounts of soluble nitrogen also can trigger disease. Turf managers should check the weather forecast regularly and be ready to use a fungicide if extended warm, moist (foggy) conditions are forecasted.

The overseeded grass and the non-dormant bermudagrass base grass can develop *Helminthosporium* leaf spot during the fall, winter, and spring months when temperatures slow grass growth. Leaf spot is similar to dollar spot in that maintaining adequate nitrogen levels usually keeps the grass growing aggressively enough to out-grow the disease symptoms. Fungicides, however, may be required during extended periods of cool weather which prevent adequate bermudagrass shoot growth.

Post-planting maintenance

Irrigation: Following seeding, irrigate lightly to carefully moisten the soil sur-

face without puddling or washing the seed into surrounding areas. Three to four light irrigations per day may be needed until all seedlings establish. Once germination begins, the seed can not be allowed to dry out or the stand will thin.

Disease management: After seedling emergence (5 to 7 days for ryegrass, 10 to 14 for bentgrass and for roughstalk bluegrass), apply a preventive fungicide to help protect against Pythium root

rot and *Rhizoctonia* brown patch, which can destroy overseeding stands. Factors which encourage these diseases include:

- ▶ unseasonably warm weather;
- ▶ using excessive seeding rates which produces young, succulent plants;
- ▶ prolonged periods of high, free moisture on leaf and stem surfaces, such as extended foggy conditions; and
- ▶ bermudagrass aggressiveness.

Proper timing and application rate of seeding, minimum use of nitrogen, efficient irrigation scheduling and the use of pre-treated fungicide seed are methods to reduce disease potential. To prevent development of resistant strains of *Pythium*, always follow the label and alternate be-

tween chemical groups.

Mowing: With ryegrass overseeding, mow greens at a 1/2-inch height when the new stand reaches 2/3- to 3/4-inches. Gradually lower the cutting height to

Once the overseeded grass becomes established, the chances of severe disease is reduced. Dollar spot usually develops when nitrogen levels are low or when Poa trivialis or bentgrass is used as an overseeded grass.

1/4- to 5/16-inch over a 2 to 3 week period at 1/32-inch increments and skip the 'clean-up' mowing lap the first few mowings to minimize traffic and wear on the tender seedlings. Continue this gradual reduction in height for 4 to 6 weeks until 3/16-inch height is reached. Tees and fairways usually are permanently mowed at 1/2-inch to 3/4-inch, respectively.

Fertilization: Do not fertilize with nitrogen during overseeding because this may encourage excessive bermudagrass competition. Adequate levels of phosphorus and potassium, however, should be maintained for good plant growth. Begin to fertilize shortly after significant shoot emergence (two to three weeks after



Thinning out of this golf green was caused because it was verticillated with ryegrass too early in the spring, on a hot day

Calibrate spreaders, define boundaries

Golf greens and tees

1) After completing the seedbed preparation steps mentioned earlier, a uniform application of seed is needed to provide a smooth and uniform playing surface. Seed should be applied when the surface is dry. Drying can be hastened by dragging a hose across the turf surface. Wind speed should be less than five miles per hour to minimize seed movement onto adjacent areas.

2) Spreaders should be carefully calibrated to deliver the appropriate amount of seed. Another method is to pre-weigh seed for a known area, such as a putting green, and carefully meter it out over the area. This usually requires numerous passes over the area to ensure uniform seed coverage and at least two directions should be used when broadcasting the seed.

3) Boundaries of the overseeded areas should be defined by using a drop spreader. The remaining seed is applied with a drop, or centrifugal, spreader within the outer fringe of the seeded area. Avoid seed spread to non-target areas such as collars, fringes, and other nearby turf areas. Unwanted seed will reduce aesthetic value and create the need for additional maintenance.

4) Clumps of ryegrass are most noticeable the spring following application and tend to remain visible into early summer. Control of these clumps, once they are established, is difficult and slow. When trying to reduce the amount of unwanted ryegrass drift, carpets and mats should be placed in the designated areas used to fill and empty spreaders. Mats also can be placed around the perimeter of seeding area to minimize escaped seed.

5) Worker's shoes and dragging equipment should be cleaned before and after entering the perimeter area surrounding the green.

If ryegrass drift is suspected outside the intended overseeded area, a premergence herbicide should be applied after

overseeding. A short boom or backpack sprayer should be used to treat areas not accessible by tractor-drawn or self-powered sprayers.

If non-fungicide treated bentgrass seed is used, a fungicide is needed for disease control. For best seed coverage, fungicides should be applied before the green is topdressed. Fresh seed also should be used as good seedling vigor is necessary for plants to quickly develop past the susceptible seedling stage. Proper seeding rates should also be adhered as higher rates should not be used since this could produce weak, succulent plants.

Once the seed have been applied, light topdressing of greens and tees at 1/3- to 1/2-cubic yards per 1000 square feet encourages desirable seed-to-soil contact and turf establishment. Seed and topdressing material is then incorporated by dragging a carpet across the seeded area. A steel mat may need to be placed on the carpet to provide sufficient weight. Topdressing should be dry before dragging to minimize seed pickup on shoes and equipment. A cover on the ground also should be used when entering and leaving overseeded areas to prevent unwanted seed movement.

Fairways

Following seedbed preparation, large areas such as fairways typically use a centrifugal spreader to disperse seed. As with golf greens, seed should be spread in at least two directions. Use a drop spreader for defining the perimeter of these areas. Fairways are seeded at 250 to 450 lbs per acre with perennial ryegrass, or 250 to 400 lbs per acre with annual ryegrass (See Table 4). Only fungicide-treated seed should be planted. Buying extra seed to repair worn or poorly established areas is suggested.

Fairway seed should be matted into the soil surface following overseeding. Topdressing usually is not used on these large areas after seeding except for intensive traffic areas such as approaches. Matting

of large areas can be achieved by dragging a rug or old carpet section over the seeded area. Another method to encourage good seed-soil contact is by operating a stiff-wire power sweeper in several directions over seeded areas. After dragging-in the seed, topdress lightly (e.g., 1/2- to 1-cubic yards per 1000 square feet) over heavy play or traffic areas with a soil mix similar to the underlying soil.

Another means of seeding fairways is through a slit applicator. Slit seeding helps overcome heavy thatch layering and generally provides good germination since the seed is in direct contact with the soil and is less susceptible to drought. Slit seeding however, requires a slit seeder, is slower to plant, can cause skips and gaps in the seeding pattern, and then have visible rows of seed until the ryegrass is mature enough to tiller.

Use of plant growth regulators (PGRs) as overseeding aids has become more popular. The PGR is applied just prior to overseeding to retard the bermudagrass growth, thus, reduce the competition between it and the newly overseeded grasses. Only foliar absorbed PGR materials should be used since root absorbed PGRs can retard the germination and growth of the overseeded grasses. Trinexapac-ethyl (Primo 1EC) applied at 8 to 16 oz/acre 2 to 5 days prior to overseeding has worked well if the bermudagrass is still actively growing with little or no effect on overseeded ryegrass. If the area to be overseeded is cultivated by verticutting prior to seeding, the advantages of using PGRs are greatly diminished.

Overseeding cool-season areas

The procedures of overseeding cool-season areas are similar to the warm-season areas, except for timing. Cool-season areas can be overseeded at different times of the year, but generally are seeded in late summer (best time) or early spring (second best time). Dormant seeding is sometimes used successfully in Northern areas when the seed is applied during late

GUIDE TO OVERSEEDING



fall or winter when temperatures prevent germination. In spring, when thawing soils are often saturated and very difficult to get heavy machinery into, the earlier seeding allows germination and establishment. Winter weather for dormant seeding should cooperate in that temperatures stay consistently cold during winter to prevent premature germination and subsequent kill by a late cold snap. The areas should also remain under snow cover to maintain steady soil moisture with little rain to move seed. One note when using dormant seeding, seed mortality is high, requiring up to 50 percent higher seeding rates above normal.

When slit-seeding or slicing, the sliced grooves should be at least 1/4-inch deep to provide this desired contact and the surface not just scratched. Several passes help ensure good coverage and less noticeable slits.

Generally, the turfgrass species chosen should match closely to that which is currently present unless a change in grass is desired or extensive turf damage has occurred. A Kentucky bluegrass fairway, for example, is generally overseeded with 100 percent bluegrass at a rate of 2 to 3 lbs/1000 sq.ft. If extensive damage or exposed areas exist (25 to 50 percent bare soil), a mixture of 2 lbs bluegrass plus 5 lbs perennial ryegrass per 1000 sq.ft. may be necessary for rapid cover. Pure perennial ryegrass areas are generally overseeded with ryegrass only.

seeding for perennial ryegrass) and continue until cold weather halts bermudagrass growth. Normally, 1/4-lb. to 1/2-lb. nitrogen per 1000 square feet every 2 to 3 weeks with a soluble nitrogen source (e.g., ammonium nitrate/sulfate), or 1-lb. per 1000 square feet per month with a slow release nitrogen source (e.g., IBDU, milorganite, SCU), is adequate to promote de-

Desirable striping of perennial ryegrass by alternating mowing directions.

sired growth without overstimulating growth and encouraging disease. **LM**

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