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Organic Amendments
continued from page 30

biological reactions occurring in the rootzone require oxygen. When oxygen is depleted faster than it can enter and diffuse into the rootzone mix, these reactions change. When this occurs, obstructions to water and air movement can develop within the mix, and toxic gases are produced. Both can lead to a poor turf stand and higher maintenance costs.

Humus is a desirable component of any soil system. The more humus present, the better the nutrient retention and cation exchange capacity of the mix. Nutrients such as ammonium, calcium, potassium, and magnesium bind to humus instead of leaching through the rootzone. The carbon to nitrogen ratio of humus is also a favorable 15:1. The humus content of the organic component is an important indication of its value in the mix.

The moisture content of organic amendments is another consideration. Dry organic materials may not rewet to their original moisture content. In general, the moisture content of an amendment should not drop below 30 percent. This level should also be consistent within the material prior to mixing with the sand. Steps should be taken to maintain moisture content prior to mixing with sand.

For the purpose of comparing various organic amendments for sand-based turf systems, four commonly used products were evaluated for their suitability. They are a reed-sedge peat from North Dakota, a Canadian sphagnum peat, a rice-hull compost, and a fir bark product from California.

There have been some problems associated with mixes that have high infiltration rates and are made of materials with wide C:N ratios. The combination of nitrogen/air competition, low nutrient retention, and high infiltration rates can make the turf grow-in period a prolonged and difficult process. Even though the grow-in may appear to be going well, the cost of nitrogen and fungicide inputs is usually high. Some of the rice hull mixes observed in the field never achieved full grow-in, even with high nitrogen rates.

Based on the data collected on the four organic amendments, the Dakota reed sedge peat meets all the technical criteria necessary for construction of a high-sand rootzone. The Canadian sphagnum would be the next best amendment.

There are significant differences among organic amendments mixed with sand in high-performance turf systems. By testing amendments prior to construction and following specifications such as the USGA’s, a turf system will establish quickly and perform well for years under reasonable maintenance levels.

Editor’s Note: Charles Dixon directs the Turf Services Division of K. W. Brown & Associates, Inc., College Station, TX.

### Physical Data For The Amendments In a Mix

<table>
<thead>
<tr>
<th>Organic Amendment Mix</th>
<th>Infiltration Rate</th>
<th>40 cm Water Holding %</th>
<th>Bulk Density g/cm³</th>
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<tr>
<td>Gillibrand Sand 100%</td>
<td>108.9</td>
<td>4.3</td>
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<tr>
<td>90% Sand:10% Rudge-Sedge</td>
<td>19.9</td>
<td>17.1</td>
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<tr>
<td>80% Sand:20% Sphagnum</td>
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<td>1.3</td>
</tr>
<tr>
<td>80% Sand:20% Rice Hulls</td>
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<td>14.9</td>
<td>1.4</td>
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<tr>
<td>80% Sand:20% Fir Bark</td>
<td>71.9</td>
<td>12.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

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Golf & SportsTURF

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Kentucky bluegrasses, the backbone of the golf and sports turf market in the north, have been suffering from an identity crisis lately. The volume of proprietary perennial ryegrass, tall fescue, and creeping bentgrass has leaped during the '80s, partly at the expense of bluegrass. However, if you listen to turf breeders, the seed market relative to the golf and sports turf industry has not yet stabilized. The jury is still out.

Development of improved Kentucky bluegrasses simply takes longer than other cool-season turfgrasses. While an exceptional tall fescue or ryegrass can go from test plots to production in less than five years, a better bluegrass takes ten or more years to get to market. Quite a few of the big-name Kentucky bluegrasses on the market today have been around for more than 15 years.

The primary improvement of Kentucky bluegrasses during the past 20 years has been in the areas of disease resistance, shade tolerance, darker color, density, and heat and drought tolerance. Beginning in the '60s, seed companies could patent improved varieties to get a return on their research and marketing investment. The market began to swing away from common types toward proprietary varieties. Today, proprietaries dominate the golf and sports turf market.

Research continues for bluegrasses that require less frequent mowing, can be mixed with turf type tall fescues, and have greater resistance to regional disease problems. The goal has been to provide dense turf that requires less maintenance.

Meanwhile, the maintenance level of golf and athletic field turf has been increasing to meet the growing demand for safe, high-quality recreational turf areas. Use levels and higher standards are pushing turf to its limits. Golfers want fairways cut at 1/2-inch, superintendents stretch their water supply by cutting back irrigation in the roughs, coaches and players want low-cut fields like the pros, and groundskeepers have to make repairs in days instead of months.

"Breeders have begun to focus more attention on the requirements of the sports turf industry for bluegrasses," explains Dr. Douglas Brede, director of research for Jacklin Seed Co., Post Falls, ID. "A growing number of seed companies and universities have machines for testing the wear tolerance of turfgrasses in their plots. Hopefully, wear testing will become part of NTEP's (National Turfgrass Evaluation Program) Kentucky bluegrass test going in this fall."

While U.S. breeders have been concentrating heavily on density, dark color, and fine texture, their European counterparts have been more concerned about wear tolerance. European cultivars tend to be lighter green, more wear tolerant, more aggressive, and green up earlier in the spring. "The Europeans have been torturing their grasses, while we have been holding a beauty contest," says Brede. "It's a matter of priorities, and maybe it's time for us to change ours."

Virtually every seed company recommends that mixtures of two or three Kentucky bluegrasses be sown to provide the broadest protection against diseases, shade, and site conditions. Mixtures offer the widest range of adaptation and allow flexibility where conditions vary within the turf facility. The best-adapted variety will dominate the stand within a few years.

In residential and commercial turf, where traffic is not the primary concern, blends of moderately aggressive Kentucky bluegrasses have been fairly standard. This prevents one aggressive type from overtaking the stand. However, the aggressive component may not be best suited for disease or shade conditions and will be more prone to creating thatch.

For golf and sports turf, a certain amount of thatch is desired. The turf manager has the ability and equipment to manage it. His primary needs are traffic tolerance and rapid recovery. As far as diseases are concerned, the main problem is overwatering, says Dr. Virgil Meier, turf breeder for O.M. Scott & Sons in Marysville, OH. The use of a well designed, well managed irrigation system plus adequate drainage can go a long way in gaining control over many diseases.

"Our results over the past two years have been that the denser, more aggressive varieties of each species have shown the best traffic tolerance under our traffic simulator," reveals Dr. William Meyer, director of research for Turf Seed, Inc., in Hubbard, OR. "Comparing species, the perennial ryegrasses are usually the most traffic tolerant, followed by the better Kentucky bluegrasses and tall fescues."

It is also important to remember that Kentucky bluegrass is the only one of these three species that creeps. "Kentucky bluegrasses will cover two to three times the area covered by ryegrasses or tall fescues during establishment," adds Meier. "It should be the base of any fairway of sports field north of the transition zone."

In the long run, bluegrass can take a lower cut than perennial ryegrass," Meier adds. "Those turf managers who tried to manage perennial ryegrass [without bluegrass] are switching back. They still use ryegrass for repairs and spot seeding, because it germinates so quickly."

"Kentucky bluegrass should be mixed with perennial ryegrass (50:50) during overseeding, once before the fall season and then again immediately after the season ends. By the spring, you will have restored the bluegrass base."

The slow rate of germination for Kentucky bluegrass is partially solved by mixing it with perennial ryegrass. In the future, seed priming and pregermination may speed up establishment by weeks. However, Kentucky bluegrass still needs time to spread and must be maintained throughout the growing season.

Superintendents and sports turf managers can take advantage of modest price reductions in many varieties of Kentucky bluegrass this fall. Most companies report good supplies and lower prices. However, some varieties are already sold out.

More specific comparisons of varieties are available from the National Turfgrass Evaluation Program, c/o Kevin Morris, U.S. Department of Agriculture, Agricultural Research Center, Beltsville, MD 20705.
ROOKIES
PRODUCT UPDATE

GREENS CONDITIONING ATTACHMENT

Designed for use on Ransomes Greens 3000 mower, the Verti-groom unit conditions and improves greens' surfaces by cutting lateral growth and removing thatch. The result is a more consistent finish to each green and a smoother putting surface.

MOISTURE SENSOR

The Aquamiser microelectronic moisture sensor automatically measures the relative change in soil moisture at the plant root zone, compares it to the desired moisture levels set by the user, and prevents the sprinkler system from operating once the required moisture levels are met. The unit eliminates the guess work of reprogramming to meet changing climatic conditions.

A valuable tool for irrigation management, the moisture sensor saves water and can lower operation costs. One unit can be set to control a single valve, a group of valves, or an entire system on a single program. Separate units can be installed to control independent programs on the same controller. The moisture sensors adjust to most types of soil and can be installed with either new or existing irrigation systems.

SOLID TINE AERATOR SYSTEMS

Cushman has introduced tine holder attachments and 1/4-inch solid tines for the Ryan GA 30 and GA 24 aerators. The tines are designed for mid-summer and off-season aeration to supplement regular spring and fall core aeration treatments. They increase oxygen, nutrient, and water intake to the turf rootzone but do not pull cores to the surface.

The system for the GA 30 aerator includes "quint" tine holders with five 1/4-inch solid steel tines and adjustable spacing. The GA 24 unit can be equipped with quad tine holders with four 1/4-inch tines and one-by-one-inch spacing.

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Golf & SportsTURF

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Fine Lawn Research proves . . .

not all perennial ryegrasses are created equal.

Stallion

As a professional turf manager, you know there are measurable differences between turfgrasses. And, as research has proven, Stallion is the new breed in turf type perennial ryegrass. No longer is your choice limited to look-alike perennial ryegrasses. Stallion establishes quickly, performs well under moderate to low fertility and, with its heavy tillering ability, produces the dense turf you require. Stallion's rich color and fine leaves blend extremely well with other perennial ryegrasses, bluegrass, fine or tall fescues. So, whether you're establishing new turf, reseeding or overseeding, remember, strength of breeding always shows - Stallion - a breed apart!

<table>
<thead>
<tr>
<th>Variety</th>
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Rated 1-9, 9 = Best

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<tr>
<td>Rated 1-9, 9 = Very Fine</td>
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</table>

TRIPLE PLAY

Since not all fairways, athletic fields, or office parks are created equal, Fine Lawn Research developed Triple Play. This is a unique blend of perennial ryegrasses that can be carefully tailored to the specific needs dictated by the use and climate conditions in your area. Triple Play includes Stallion plus two other elite turf type perennial ryegrasses. You no longer have to settle for a perennial ryegrass blend that is only satisfactory. You can have Triple Play blended to your requirements. Ask your local distributor how you can get Stallion blended specifically for you!

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For additional information, see your distributor or dealer, or write to Fine Lawn Research, Inc. 4900 Blazer Pkwy, Dublin, Ohio 43017

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The Humax Base reactor process breaks down organic waste materials into humic acid. Fertilizer nutrients are then attached to these humic acid molecules to form a large organic colloid, with nutrients readily available for plant uptake.

These newly bonded nutrients are then held stable in the plants’ root systems, which increases, draws out, and strengthens their feeding capacity. By creating a well balanced, ecologically sound, and biologically active soil structure, fewer applications are required and less water is needed to maintain growth.

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Both models come with five interchangeable nozzles to vary the radius and discharge rate. The radius can be varied from 45 to 67 feet and the discharge rate can be adjusted from seven to 25.3 gpm.

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HOW TERRA-GREEN WORKS
The small granules of pure, inorganic mineral rapidly absorb and store water in thousands of little pores and capillaries and hold it in suspension in surface crevices for gradual release to thirsty roots. Kiln processing super hardens the granules for permanent stability and long-term effectiveness in the soil. Because the granules are chemically neutral and inert, they are completely safe to handle and apply.

HOW TO APPLY TERRA-GREEN
After Aerifying: Rake or drag one 50-lb bag per 200 sq. ft. into aerified holes.
Without Aerifying: Spread one 50 lb. bag per 500 sq. ft. to level depressions, dilute thatch, increase drainage. May also be used with sand and soil mixes.
New Construction: Use as 15 to 35 per cent component of top-soil layer. See table at left.

The information in this data sheet is believed to be accurate. However, each purchaser should make its own test to determine the suitability of the product for its purposes. OIL-DRI CORPORATION OF AMERICA MAKES NO WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT and assumes no responsibility for any risk or liability arising from use of the information or the product. Statements about the product should not be construed as recommendations to use the product in infringement of any patent.
**ROOKIES**

**PRODUCT UPDATE**

**COLORED POLYETHYLENE PIPE**

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The pipe is available in 100- to 400-foot lengths, in 1/2-, 3/4-, one-, 1-1/4-, 1-1/2-, and two-inch sizes.

**RETRACTING IRRIGATION REELS**

Available in one-, 1-1/4-, 1-1/2, and two-inch hose diameters, Orma leader reels use high-efficiency turbines to operate with no water loss and minimal pressure loss.

A low working pressure of four psi and automatic water shutoff enables the reels to be used on almost any job site. The products' heavy construction makes them ideal for commercial applications.

**AR ASSOCIATES, INC.**

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**SELF-PROPELLED STRIPER**

The TMS-4 self-propelled striping machine has a simple friction drive system. Powered by an eight-hp air-cooled engine and a 13.2 cfm twin-cylinder cast iron compressor, the unit can spray a single one- or two-inch wide line or two six-inch parallel lines simultaneously.

An hand gun can be added for spraying curbs, stencils, poles, etc. A reflective bead dispenser and gun purge system are also available.

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The Salsco 300-Series line of walk-behind blowers have balanced impellers and provide both side and forward air streams. Certain models are also equipped with a debris intake for removing remaining debris.

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