Soil problems? 
Try an ‘amendment’

Though they come in all shapes and sizes, each has specific functions. Here are some available products and what they can do for you.

- Soil problems are the bane of landscape managers everywhere. In most turf textbooks, entire chapters are devoted to soil characteristics and the problems they create in growing healthy turf.

When problems arise with soil composition, turf managers might turn to a class of products known as “soil amendments,” which can modify soil characteristics in any number of positive ways.

Soil amendments can modify:
1) soil texture
2) soil structure
3) the soil’s chemical properties
4) the soil’s long-term stability
5) availability of nutrients, water, etc. to the plant
6) amount of other treatments (fertilizer, pesticides) required
7) cost of maintaining healthy plants

Soil amendments are used to increase air porosity, change permeability, or increase water retention. Many contain micronutrients or in some way benefit nutrient release and/or overall plant health.

Soil amendments come in as many different forms as there are uses. They range from sand—found naturally in the environment—to many specialty products like super-absorbent polymers.

Some common types of soil amendments are inorganic, usually in granular form. They can improve pore space, water retention, percolation and infiltration, and correct acidity. The most commonly used coarse amendment is sand because of its effectiveness, stability and low cost.

- Organic amendments are calcined clay (Dialoam, Turface, Terra-Green), processed mica (vermiculite, Terralite), lime (Limestone F, Lime Crest), perlite, diatomite, ureaform aggregates (Hydromul, Styromul), clinoptilolite zeolite (Aquasand), expanded shales (Haydite, Weblite, Idealite), activated charcoal, pumice, slag, fly ash, and cation and anion exchange resins.

Another kind of soil amendment is organic in nature. They improve soil structure, aeration, nutrient and water retention, resiliency, aggregation and cation exchange capacity, and increase the population of beneficial microorganisms.

These amendments can be used to improve water infiltration and water retention. Good examples are Aqua-Gro, Hydrowet, Lescowet, and others.

BENEFITS OF SOME SOIL AMENDMENTS

- Calcined clay improves pore space, water retention, water infiltration, water percolation.
- Lime improves soil chemical properties (corrects) acidity.
- Organic amendments improve soil structure, pore space, nutrient retention, water retention, soil resiliency, cation exchange capacity.
- Processed mica improves water retention, pore space, cation exchange capacity.
- Sand improves aeration, water infiltration, water percolation.
- Wetting agents improve water retention.
Soil amendments

Terra-Sorb.

In some cases, compost materials are also considered soil amendments. They are used to improve soil structure and water retention.

Other types of soil amendments:
- soil conditioners,
- polymers (like Kriilium for reducing erosion, Terra-Sorb, StockSorb),
- sewage sludge (for enhancing soil texture, improving aeration, infiltration and water-holding capacity, like Earthmate);
- clay balls (for infiltration, nutrient and moisture retention),
- starch polymers (like Super-Slurp for water retention), and
- mulches (for temperature stability, less water evaporation).

Following is a partial list of the many soil amendments available.

—Jerry Roche

Basic suppliers...

For more information about a specific company's products, please circle the number on LM's Reader Service Card that corresponds with the number listed below:

- Agro-Tech 2000 (#190)
- Aimcor (#191)
- Amerex (#192)
- Aquatrols (#193)
- Arctec (#194)
- Back to Earth (#195)
- Bondie (#196)
- W.A. Cleary (#197)
- Conrad Fafaro (#198)
- Creative Curb (#199)
- Dakota Peat (#200)
- Doggett (#201)
- Earthgreen (#202)
- Earthworks (#203)
- Emerald Isle (#204)
- Evans Landscaping (#205)
- Finn Co. (#206)
- Floratine Products (#207)
- Four Star Services (#208)
- Jonathan Green (#209)
- Green Pro Svs. (#210)
- Gro-Power (#211)
- Growth Products (#212)
- Harford Industrial (#213)
- Humate Int'l. (#214)
- Humus Products (#215)
- Industrial Services (#216)
- Industrial Services (#217)
- JRM Chemical (#218)
- Kalo (#219)
- Kurtz Brothers (#220)
- Lesco (#221)
- Master Turf (#222)
- Michigan Peat (#223)
- National Bark (#224)
- Nature's Touch (#225)
- Northwoods Organ. (#226)
- Parkway Research (#227)
- Par tac Peat (#228)
- Prismatic (#229)
- PRS Materials (#230)
- PSA (#231)
- Roots/RGB (#232)
- Sartec (#233)
- Soil Seal (#234)
- Stabilizer (#235)
- Stockhausen (#236)
- Sustane (#237)
Market Earthmate: a bio-compost that enhances the physical structure and workability of the soil. (Prism)

Maxiplex: a concentrated humic acid. (Floratine Products)

Nature's Blend: a compost material, made either of mixed yard waste or leaf waste, that conditions the soil for better plant rooting and increases cation exchange capacity. (Kurtz Brothers)

New Mexico Menefee Humate: a granular product that helps guard against contaminants in the soil, balances micronutrients, improves soil structure and cation exchange capacity. (Earthgreen Products)

N-Hance: liquid calcium in a humic acid base that acts as a sodium reducer, root stimulant and nitrogen stabilizer for turf. (Earthworks)

Northwoods Organics: custom-processed peat to match sand particle size in loose bulk, "super sacks" and compressed bales. (Northwoods Organics)

Nutra-Aid: derived from plant extracts and manures that improves permeability and penetration, helps retain organic matter. (Nature's Touch)

Nutri-Sul: a sulfuric acid soil treatment that, after injection, reduces soil pH and releases minor elements. (Doggett)

Partac: a heat-treated golf course peat topdressing. (Partac Peat)

Pelletized Gypsum: conditions clay soil and neutralizes salt damage. (Jonathan Green)

Pene-Turf: a biodegradable product that improves permeability and aeration, promotes proper drainage, reduces erosion. (Four Star Services)

Penn-Mulch: a seedbed mulch made from recycled paper that contains starter fertilizer to protect seedbeds. (Agro-Tech 2000)

Pervade: a biodegradable wetting agent and penetrant. (Floratine Products)

Professional Soil Bioinoculant: an all-natural animal by-product containing soil microorganisms and all-natural fertilizer that helps reactivate sterile-type soils. (Lesco)

Potent-Sea: a liquid sea kelp biostimulant that stimulates roots, reduces head stress and reactivates sterile-type soils. (Lesco)

Potential: a liquid sea kelp biostimulant that stimulate roots, reduces head stress and increases microbial activity. (Earthworks)

Primer 604 Matrix Flow: a liquid calcium in a humic acid that improves water efficiency. (Sartec)

Sea Humus: cold-processed seaweed plus humic acid that conditions soil. (Humus Products)

SeaGreen (Plus): a liquid kelp product that supplies micronutrients to soil, with or without fish emulsion. (Bonide Products)

Soil Acidifier: 90% elemental sulfur that lowers soil pH, improves disease resistance and plant hardiness, lowers water usage. (Bonide Products)

SoilMoist: polymer composts that increase seed germination. (JRM Chemical)

Soil Seal: high-grade latex acrylic soil stabilizer that helps prevent erosion when sprayed on the soil by stabilizing its surface. (Soil Seal)

Stabilizer: an organic soil additive that helps produce a firm, consistent surface under all weather conditions. (Stabilizer)

StockSorb: an absorbent polymer for turf, nursery and horticultural applications that performs well against soil pressure. (Stockhausen)

Sulfur-F: a sulfur product that acidifies soil. (W.A. Cleary)

Super-Cal Liquid Limestone Substitute: improves germination and root development. (Jonathan Green)

Supersoil: a blend of topsoil, regrow, peat moss, mushroom compost and perlite. (Evans Landscaping)

SuperSorb: acrylic copolymer crystals that act as water absorbent to retain water and release as required by the plant. (Aquatrols)

Sustane Soil Builders: improves germination and root development. (JRM Chemical)

Terra-Green: a soil conditioner drying agent and topdressing. (Partac Peat)

Terra-Sorb: a super-absorbent polymer called acrilomide that holds and manages water release to the plant. (Industrial Services)

TurfGrid: a fibrillated polypropylene fiber that stabilizes sand-based sports turf. (Stabilizer)

Vita-Herb: an all-natural organic plant material in liquid form that breaks the surface tension and thaks for water penetration into the soil and stimulates root development. (Green Pro Services)

Vital Reactions: a product made of plant materials only that reduces soluble salts, encourages water penetration and stimulates root and rhizome growth. (Nature's Touch)

Vittera Geescape, Plant-Gel, Root-Dip: (Amereq)

Wet Foot G: a granular wetting agent that contains Wet Foot L on vermiculite, to be mixed with peat, soils or soilless mixes for moisture control. (Parkway Research)
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New techniques in nematode production have brought down the costs to be more in line with other control agents. “They’re able to produce trillions of nematodes a day rather than billions of nematodes a day,” he explains, adding that the cost to apply one billion nematodes per acre—the recommended rate—is about $70.

Nematodes are also becoming available for use on warm season grasses. “There’s several nematode types that are being developed for Southern lawns,” he reports. Nematodes are especially effective in controlling fleas and mole crickets. “Mole crickets sort of take over the grubs (as a main pest) in Southern lawns,” Shetlar says.

It is especially important to discover that nematodes are indeed selective when it comes to which organisms are targeted. “In the lab, nematodes kill any insect they can get into. In the field, there was concern that they would be no different than an insecticide that kills everything. Thankfully, that’s not the case. People who are looking for a selective, non-chemical treatment can use these nematodes,” Shetlar says.

Entomopathogenic nematodes kill insects not as parasites, but as agents of disease. A nematode larva enters the insect just as a parasite does. But rather than feeding directly on the insect, it regurgi-
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- The author is a freelance writer based in Cleveland, Ohio.

Nematodes are particularly effective against bluegrass billbug larvae. Untreated plots had about 80 bugs per square meter; treated plots had only about 14.

- Nematodes run out of steam pretty quickly. At two weeks after the initial treatment, two-thirds of the "guinea pig" waxworm larvae were infected; at seven weeks, fewer than one-third were infected. "This result means it is important to apply the nematodes when the billbug larvae are feeding in the soil near the turf crowns, usually in mid-June," Shetlar says.

- Most importantly, nematodes appear ineffective against beneficial garden predators and decomposers. Study results show no significant differences between treated and untreated turf in numbers of earthworms, mites, spiders, centipedes, millipedes, and beetles.

"Within a month after the nematode application, populations of non-target organisms were pretty well normal," Shetlar reports.

"In terms of non-target insects, we were most concerned with above-ground beetles and rove beetles," Shetlar notes. "They're probably the No. 1 predator of cutworm eggs and sod webworm eggs. According to our results, entomopathogenic nematodes should not harm these populations."

Shetlar says that nematodes can present a convenient, economical and environmentally friendly method of turf pest control. For best results, a mid-June application (in Ohio, local weather conditions may vary) is advised. "The best results occur when the lawn is moist from recent rains or just after a watering," Shetlar points out. "I also recommend a generous watering immediately after applying the nematodes."

Sub-surface placement—The researchers applied the nematodes in mid-June using a sub-surface applicator. This device, a Rainsaver Jr., slit the turf every three inches and injected nematodes to a depth of about one inch. The injection unit was important because it protected the nematodes from damaging rays from the sun, Shetlar says.

To gauge the effect of nematodes on centipedes, spiders, mites and non-target insects, the researchers took soil cores from all sites—treated and untreated—every 10 days. They measured the effect of nematodes on their actual targets, billbugs and sod webworms, by sampling and counting the number of pests in the nematode-treated sites as opposed to the non-treated sites.

The results:

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