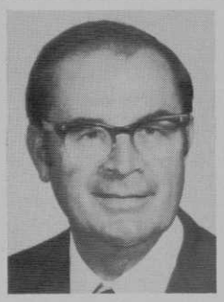
Superintendent skills

By Jim Converse



Jim Converse is one of America's leading botanical artists. His paintings and drawings have appeared in numerous national publications, and his weed and grass identification books have become standard tools of the trade. Jim is far more than a botanical artist, however, with years of practical turf experience. Before assuming turf management reponsibilities at OM Scott & Sons Company, more than 20 years ago, he worked as a golf course superintendent. After tours in Scotts Research and Retail Training areas, Jim was transferred to the ProTurf Division where he headed their training and educational programs. He is currently concentrating his talents in the area of visual communications.

Improved turfgrasses

Many times the golf course superintendent has an opportunity to attend a field day and inspect various turf plots. It's quite natural to be impressed by those grass varieties that look exceptionally good. But, that first impression, like most other first impressions, should always be tempered and weighed. Only after a particular grass has delivered a proven performance year after year and under a full scale of adversities can it ever become an exceptional turfgrass. Even then, a grass still has its limitations, because it can be a tremendous success in one part of the country and a complete failure in another.

Some grass varieties are the result of hybridization, or the crossing of two parent plants to form a unique offspring. But, a far greater number of new varieties have evolved from a process called "natural selection." "Natural selection" means finding a plant, or cluster of plants, that exhibit some exceptional qualities or characteristics. Most of today's improved bluegrasses have been developed through this system.

It's probable that the first quality desired in natural selection is a pleasing dark green color, but there are many other important considerations. Growth habit and leaf texture are very significant. If vigor is especially desirable, the single plant that thrives in an area of heavy traffic and compaction should be a strong candidate. Along these same lines, what about the healthy plant surrounded by turf destroyed by disease? There are many things that a turfgrass scientist must consider in natural selections, and because of the sameness of any piece of turf, finding a truly unusual plant must be extremely difficult. When that truly unusual plant has been found, it's only the first step in a long series of events that can take years to complete. The odds against any single grass plant eventually becoming a grass variety are more than astronomical.

It takes about two years before our new plant has produced enough seed to even start testing it as a turfgrass. Depending upon the depth and scope of research, in the days, months and years that follow, the new turfgrass will be subjected to many critical stresses and evaluations. Continuous ratings are given for quality of cut, performance under various cutting heights, color during all seasons, density, growth habit, leaf texture, disease resistance, shade and drought tolerance and whatever else the turf researcher feels is important. It's a cold, hard, time consuming and often disappointing procedure. A grass plant can easily be carried into a program for four or five years and then exhibit a glaring weakness that makes further exploration impossible. Unfortunately, environmental circumstances are not predictable, but a good turfgrass is expected to survive and thrive through all variables.

If a new turfgrass has the good fortune to survive low cutting and other abuses, while retaining high marks in desirable characteristics for a long period of time, it has a fair chance of becoming a variety. But, there are at least two other steps that play a large part in determining success, or failure. This new grass must be able to perform in actual use situations over a wide area of geographic adaptability. These areas are often golf course fairways, tees, homelawns, playgrounds, athletic fields, or anyplace where turf is subject to variable uses and degrees of care. As in the original testing, results must necessarily be evaluated over several growing seasons of environmental variation. If the grass performs poorly in any region of this zone of adaptability, chances for success are again diminished, if not eliminated. Somewhere during the program of evaluation, the turfgrass scientist must make a determination that has nothing to do with turf. From the first tiny harvest of seeds for additional research, until the variety is accepted, or rejected, there has to be a secure knowledge of what kind of seed producer this variety will be. It's an extremely important consideration. Without a fair return on investment, there would be no improved turfgrasses and no continuing research. Professional growers in the Pacific Northwest with a great investment in land and specialized equipment must also be assured of a fair profit. Without some assurance, there would be no incentive to stay in this highly restrictive and exacting business.

When the golf course superintendent, or other turf professional makes a decision to plant seed, his purchase should be given more than a casual appraisal. The seed that he places in the ground will be expected to produce an exceptional turf for many, many years. But, quite often the turf is less than adequate and there are continual maintenance problems. A superintendent must know and evaluate the seed that is available in his area and what is unquestionably best for his particular situation. Since there are no truly flawless individual performers, he must also weigh the advantages of using varieties to produce a strong blend.

Planting grass seed is today's choice, and the wisdom of the choice can only be evaluated in the future. A poor selection could bring a bitter memory through continous problems. Unfortunately, these problems, once established can be almost impossible to eradicate.

In actuality, the difference in price between quality seed and poor seed is very small. If a variety has been properly and thoroughly researched, by universities and industry, there can be no sensational bargains. Occasionally a new variety will break on the scene with much fanfare, but few credentials. When this happens, the consumer bears the burden of final research, and it can be quite costly.

Years of painstaking evaluations have gone into the establishment of today's improved turfgrass varieties. And many new selections are constantly being exposed to the rigors of critical examination. It's an absolute certainty that none will reach the top without solid credentials and proven performance. With so many good choices available, there seems to be little reason to plant anything but the best.

Fungicides for use on turfgrass

(Editor's note: The following list is compiled for general information ONLY. It is against federal law to use any fungicide in a manner inconsistent with its label. For specific information on any product listed, please write the information number on the Reader Service card and mail it.)

Bonide Chemical Co. Inc., 2 Wurz Ave., Yorkville, NY 13495

Benomyl Lawn Fungicide Granules

Active ingredient: Benomyl 1.6%

Dollar spot, large brown patch, fusarium patch, fusarium blight, stripe smut

Apply at: 5 lb./2500 sq. ft. Water before application

TOXIC TO FISH

Lawn Disease Control

Active ingredient: Thiram 10%

Large brown patch, dollar spot

Apply at: 1½ lb./1000 sq. ft. Water before application if turf is dry

Turfcide 10G Fungicide

Active ingredient: PCNB 10%

Brown patch

Apply at: 7½ lb./1000 sq. ft. Water after application

TOXIC TO FISH

W.A. Cleary Chemical Corp., 1049 Somerset St., Somerset, NJ 08873

Bromosan

Active ingredient: thiophanate 16.67%, thiram 50%

Wettable powder

Dollar spot *Apply at:* 6 oz./5-10 gallons of water/2000 sq. ft.

Copper spot, brown patch *Apply at:* 6 oz./5-10 gallons of water/1500 sq. ft.

Helminthosporium leaf spot *Apply at:* 6 oz./1000 sq. ft.

Snow mold *Apply:* fall, 9-12 oz./5-10 gallons of water/1000 sq. ft.; mid-winter, spring thaw, 4.5 oz./1000 sq. ft.

Do not apply to snow-covered turf

TOXIC TO FISH

Caddy

Active ingredient: Cadmium chloride 20.1%, total cadmium 12.3%

Dollar spot, copper spot

Apply at: 1 oz./1000 sq. ft.

TOXIC TO FISH AND WILDLIFE

Cad-trete Granular Fungicide

Active ingredient: Thiram 2.5%, Cadmium chloride .38%, total cadmium .22%

Snow mold

Apply at: 48 lbs./6000 sq. ft. Apply in late fall and during mid-winter thaw

TOXIC TO FISH

Granular Turf Fungicide

Active ingredient: Thiram 5.0%, cadmium chloride .75%, total cadmium .43%

Copper spot, dollar spot, leaf spot, brown patch

Apply at: 20 lb./10,000 preventative, 20 lb./5000 curative. Apply when dew is on grass

Snow mold

Apply at: 20 lb./5000 in late fall, repeat in January

TOXIC TO FISH AND WILDLIFE

PMAS

Active ingredient: Phenylmercuric acetate 10%

Pink snow mold

Apply at: 1 oz./1000 sq. ft.

Gray snow mold

Apply at: 2 oz./1000 sq. ft.

For use on golf greens, tees, aprons only, DO NOT USE on M Merion Kentucky bluegrass or Velvet bentgrass

TOXIC TO FISH AND WILDLIFE

Spectro

Dollar spot, copper spot, brown patch, leaf spot

Apply at: 3 oz./1000 sq. ft. for dollar spot, 4 oz./1000 sq. ft. for rest on greens, tees, and fairways

TOXIC TO FISH

Spotrete-F

Active ingredient: Thiram 42% (4 lb./gal.)

Dollar spot, Brown patch, snow mold

Apply at: 3¾ oz./1000 sq. ft. for dollar spot and brown patch, 12 oz./1000 sq. ft. for snow mold, on a preventive basis; 7.5 oz./1000 sq. ft. for dollar spot and brown patch on a curative basis

TOXIC TO FISH

3336

Active ingredient: thiophanate 50%

Wettable powder

Dollar spot, copper spot, large brown patch, red thread

Apply at: 2 oz./1000 sq. ft.

Stripe smut, fusarium blight, leaf spot

Apply at: 4-8 oz./1000 sq. ft.

Irrigate immediately after application to drench 3336 into rootzone

For use on bentgrass, bluegrass, bermudagrass, fescues, ryegrasses, St. Augustine and their mixtures

Diamond Shamrock Corp., 1100 Superior Ave., Cleveland, OH 44114

Daconil 2787

E.I. du Pont de Nemours & Co. (Inc.), Biochemicals Dept., Wilmington, DE

Tersan 75

Active ingredient: Thiram 75%

Large brown patch, dollar spot, snow mold

Apply at 3-8 oz./1000 sq. ft.

Tersan 1991

Active ingredient: Benomyl 50%

Dollar spot, large brown patch, fusarium patch, fusarium blight, stripe smut, helminthosporium diseases

Apply at 1-8 oz./1000 sq. ft.

Tersan LSR

Active ingredient: maneb 80%

Leaf spot, rust, rhizoctonia brown patch

Apply at 3-4 oz./1000 sq. ft.

Tersan SP

Active ingredient: chloroneb 65%

Snow mold, pythium blight

Apply at 4-9 oz./1000 sq. ft.

Mallinckrodt, Inc., P.O. Box 5439, St. Louis, MO 63147

Cadminate

Calo-Clor

Fungo 50

Koban 30

Kromad

Mobay Chemical Corp., Agricultural Chemicals Div., Box 4913, Kansas City, MO 64120

Lesan

Active ingredient: fenaminosulf 35%

Wettable powder

Cottony blight (pythium)

Apply at: ¼-⅓ lb./10 gallons of water/1000 sq. ft.

TOXIC TO WILDLIFE

Olin, Agricultural Division, P.O. Box 991, Little Rock, AK 72203

Terraclor

Active ingredient: PCNB

Brown patch

Formulation: 75% Wettable powder

Apply at: 1 lb./10-15 gallons of water in warm season grasses; 1 lb./40 gallons of water/1000 sq. ft. in dichondra; 3-4 oz./3-6 gallons of water/1000 sq. ft. in cool season grasses

Formulation: 2 lb. emulsifiable

Apply at: 1 qt./10-15 gallons of water/1000 sq. ft. in warm season grasses; 1½ qt./40 gallons of water/1000 sq. ft. in dichondra

TOXIC TO FISH

Turfcide

Active ingredient: PCNB 10% granular

Brown patch

Apply at: 7½ lb./1000 sq. ft. in warm season grasses and dichondra. Water lightly after application to einsure movement into soil

Formulation: Emulsifiable 24%

Apply at: 1 qt./10-15 gallons of water/1000 sq. ft. Lightly water

TOXIC TO FISH

O M Scott & Sons, Marysville, OH 43040

Proturf Broad Spectrum Fungicide for use on summer turf diseases

Active ingredients: PMA .69%, Thiram 4.65% granular

Brown patch, red thread, copper spot, dollar spot, leaf spot

26 lb. package treats 11,000 sq. ft. Syringe lightly to prevent pick-up by shoes or golf balls

Proturf Broad Spectrum Fungicide for use on winter turf diseases

Pink and Gray snow mold

26 lb. package treats 11,000 sq. ft.

For use on turfgrass greens, tees and aprons only

Proturf 101V Broad Spectrum Fungicide

Active ingredient: chlorothalonil 9.5% granular

Helminthosporium leaf spot, dollar spot, brown patch, copper spot, curvalaria leaf spot, stem rust on Kentucky bluegrass; dichondra (California only), Alternaria leaf spot, gleosporium (anthracnose)

29 lb. package treats 11,000 sq. ft.

Proturf Systemic Fungicide

Active ingredient: thiophanate methyl 2.3% granular

Brown patch, dollar spot, leaf spot

29¾ lb. package treats 22,000 sq. ft.

Proturf Fungicide II

Active ingredient: Chloroneb 6.25% granular

Pythium blight, gray snow mold

32¾ lb. package treats 11,000 sq. ft.

Proturf Fungicide III

Active ingredient: Dyrene 8.70% granular

Brown patch, dollar spot, leaf spot, red leaf spot, melting out, gray snow mold, copper spot, rust

29 lb. package treats 11,000 sq. ft. Apply to moist foliage

PBI/Gordon, Kansas City, KS 66118

Dymec 50

Snow mold, brown patch, copper spot, dollar spot, helminthosporium leaf spot, meltingout, rust

Apply at ¼ to ½ lb./1000 sq. ft.

Formec 80

Active ingredient: zinc iron and manganes ethylene bisdithiocarbamate 80%

Fusarium blight, red thread, pink patch, brown patch, rust, pythium blight, slime molds, algae, dollar spot, fusarium snow mold, pink snow mold, fusarium patch, helminthosporium melting out

Apply at 4 oz./1000 sq. ft.

Rhone-Poulenc Inc., P.O. Box 125, Monmouth Junction, NJ 08852

Chipco Thiram 75

Active ingredient: Thiram 75% wettable powder

Brown patch, dollar spot

Apply at: 6 oz./1000 sq. ft.

Snow mold

Apply at: 8 oz./1000 sq. ft. in late fall, 4 oz./1000 sq. ft. in spring just after snow melts

TOXIC TO FISH

Chipco 26019

Active ingredient: iprodione 50%

Dollar spot, brown patch

Apply at: 1.5-2.0 oz./1000 sq. ft.

Helminthosporium leaf spot (including red leaf spot), melting out

Apply at: 2.0 oz./1000 sq. ft. on bluegrass, bent grass, bermudagrass

Fusarium blight

Apply at: 4.0 oz./1000 sq. ft.

Fusarium patch (Pacific NW only)

Apply at: 2.0-4.0 oz./1000 sq. ft.

Gray and Pink snow mold (suppression only)

Apply at: 2-4 oz./1000 sq. ft.

TUCO, Div. of the Upjohn Co., 7171 Portage Rd., Kalamazoo, MI 49001

Acti-dione RZ

Active ingredient: cycloheximide 1.3%, PCNB 75%

Large brown patch, melting out, rust, dollar spot, fading out, grease spot, powdery mildew, leaf spot (helminthosporium), gray leaf spot

Rates vary for disease and preventative or curative control

For use on bluegrass, bentgrass, bermudagrass, fescue, ryegrass, St. Augustine

TOXIC TO FISH AND WILDLIFE

Acti-dione TGF

Active ingredient: cycloheximide 2.1%

Dollar spot, melting out, fading out, rust, powdery mildew, leaf spot

15 oz. package in 75 gallons of water treats 15,000 sq. ft. Use on bentgrass, bluegrass, fescue, ryegrass

TOXIC TO FISH AND WILDLIFE

Acti-dione Thiram

Active ingredient: cycloheximide .75%, Thiram 75%

Dollar spot, fading out, gray leaf spot, helminthosporium leaf spot, large brown patch, melting out, pink patch, powdery mildew, rust

Apply at: 2.0 oz./5 gallons of water/1000 sq. ft. for preventative; 4.0 oz./5 gallons of water/1000 sq. ft. for curative

Snow mold

Apply at: 6.0-8.0 oz./5 gallons of water/1000 sq. ft. as spray; for dry, mix 6.0-8.0 oz./10 qts. sand or screened compost/1000 sq. ft.

TOXIC TO FISH AND WILDLIFE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CORRECTING GREENS

When all else fails use proven guidelines

By William S. Brewer, Jr., Agronomist, NE Region, USGA Green Section

Considering the exceptional nature of our resources and of the agronomic knowledge available, one might wonder why all putting greens are not perfect. While some puzzling situations exist, along with factors that are either imperfectly or not at all understood, nearly all poor greens can be faulted for inadequate design and construction techniques or materials.

Construction

As a general rule, any green more than 20 years old on a course that has 200 or more rounds daily, particularly during periods of adverse weather, is likely to be a candidate for rebuilding. Two decades ago soil profiles had not yet been engineered to withstand this level of traffic and still maintain sufficient pore space for supporting vigorous turfgrass roots. When these older greens are also overburdened with additional problems, such as shadiness, restricted air movement and non-ideal surface drainage, the very life of large sections of turf can repeatedly be in jeopardy.

What about newer greens? There is no doubt that the performance record has improved. However, it would not be safe to assume that the best available information on design and construction methods has always been used. Indeed, serious problems continue to be built into golf greens, most particularly where a rigid set of specifications has not been contractually agreed upon and ensured through a schedule of quality control inspections and material analyses.

The United States Golf Association continues to seek improvements in the Green Section specifications for putting green construction, but it does not sanction modifications that have not been rigorously researched. Greens built in accordance with these specifications will, in most instances, cost more initially than greens built using techniques designed to make the work easier or faster. Yet it will take two or more years after they're built to realize the value of the more exacting specifications. It will take time for thorough profile settlement and turf density development to achieve maximum effects upon such vital physical characteristics as water infiltration rate will certainly fall to no more than half (and, perhaps only one-fifth) of that determinable in the laboratory.

Nor should designs be approved that fail to resolve future problems that might reasonably be anticipated: traffic constrictions, limited cupping space, inadequate room or contouring for maintenance equipment, surface or subsurface water flow problems, and so forth.

In short, functional criteria for greens do exist, those which common sense will reveal and those which are sufficiently complex that they were developed through painstaking research. Neither sort of functional criteria can be overlooked or subrogated to other kinds of criteria without increasing the risk of altimate disappointment.

Technology was not available two decades ago to build greens to withstand a high level of traffic without becoming compacted.

Corrective measures

Short of rebuilding, what might be done to improve upon the problems inherent with a green not constructed to withstand today's heavy traffic?

First, look toward eliminating or modifying any other possible source of difficulty — tree root invasion, traffic concentrations, uneven irrigation patterns, drainage problems, etc. In many instances too, a hard look should be taken at the possibility of regulating total volume of play, and certainly at the wisdom of permitting play when surface soils are saturated with water. That is, readily identifiable, agronomically unfavorable situations cannot be neglected. Management cannot dodge responsibility for establishing and enforcing policies which protect the golf course from inadvertent damage by golfers allowed to play in excessive numbers or during periods when the turf or surface soils are rendered critically sensitive to traffic stress by extremes in climatic conditions.

Second, develop a program to improve the rootzone through aerification and topdressing. A nearly complete transformation can be achieved within a year or two if the program is designed well and carried forth resolutely.

Commitment

It cannot be stressed strongly enough that the attitudinal aspects of a surface improvement program are every bit as important as the technical details. In case after case that could be cited, the golf course superintendent and his club are able to consistently produce an excellent golf course in spite of having to contend with problem situations which are not significantly different from those affecting neighboring courses.

Cut away the many layers of detail that make up the rich texture of any golf course and the men responsible for it, and in the consistently successful operation you will find a steadfast will to succeed. The unavoidable setbacks are not overwhelming. Unanticipated problems are recognized for what they are, as additional factors to be fitted into the overall equation. Problems become debilitating only in propor-

tion to the time spent in commiserating about them. With forward thinking, seeming difficulties can often be turned to advantage; but where that determination does not exist, no amount of expertise can bring about a trend reversal.

The responsibility for performance rests co-equally with the superintendent and his boss(es), the individual or group responsible for ensuring support for the golf course maintenance operation as it is developed by the superintendent. Often we encounter resourceful superintendents who are unjustly criticized, men whose demonstrable level of achievement is being held back, not by their own shortcomings so much as by a lack of the necessary tangible resources, administrative policies and moral support of their efforts to provide that degree of golf course excellence desired and deserved by the players. Be clear about this for without an attitude of positive commitment seated firmly and harmoniously at both ends of the management table, the golf course and, in particular, any program set forth for improving putting surfaces is certain to fall short of expectations.

Program specifics

Rather than provide a stepwise discussion of a model program for putting surface improvement, the remaining space will be devoted to addressing some questions which are frequently raised. The references supplied at the end can be used to gain access to further literature.

Why maintain that commitment to such a program is of utmost importance? For three reasons: *(1)* Additional resources must be allocated. Naturally topdressing and seed need to be purchased, and perhaps handling and application equipment as well. There may be other non-soil related problems to rectify. Provisions should be made for the testing of materials, both preliminary to final selection and periodically thereafter as a quality control check. Some redistribution of labor may be needed within the total manhour requirements. A three-man crew should be able to apply a light dressing (½ cubic yard per 5,000 square feet) and restore nine greens to play in four to five hours, given efficient equipment, freedom from interference and a material which presents no handling problems. To maximize the program's effectiveness, topdressing should be carried out once each growing month, including twice (or more) at a heavier rate in conjunction with aerification for the first years of this program. From operational costs, estimated using the above guidelines, it will be seen that the most expensive factor can be the unit price of the topdressing material itself. Thus it will pay to shop around.

(2) The second reason why commitment is vital is because, unlike most greens maintenance procedures, the aerification topdressing seeding program intentionally disrupts the playing surface for a time in order to attain a better surface over time. Moreover, this must be done periodically through the growing season, which necessarily coincides with the active golfing season. Further still, the most disruptive parts of the program, the aerifications, need to be done according to the demands of nature's calendar, not the golfing calendar. Some golfers will, without fail, perceive this as a deliberate attempt to ruin their enjoyment of their game. With them, no amount of explanation or rational argument will prevail. One can only be firm and maintain composure. Others will at times become upset, but they can be won over. All players deserve to be kept informed well in advance, to have the program developed so as to minimize the degree and length of disruptions, and to have the golfing calendar planned around the program so that key tournaments will not conflict with it.

(3) The final reason for dwelling on commitment is that there is not way to guarantee uniformly uneventful success in this or any other program involving the culture of growing plants. If the will to achieve success in spite of encountered difficulties is weak, the program will hit the skids long before it has been given sufficient time to prove its worth.

What if the greens present no soils-related management problems and are consistently maintained to the golfers' liking? Clearly in this situation one would be ill-advised to radically alter what is already a successful program. Be alert, however, for changing conditions, particularly to increasing traffic pressures. This is not to say that for courses where the greens are already in great shape some type of aerification and top-dressing program is not needed. Very likely the prevailing good conditions are due principally to such efforts as they have been adapted to suit the

particulars of the situation.

If one is unsure if the existing soils or topdressing is contributing to management difficulties, is there any way to check these materials for performance characteristics relative to some objective standards? And, is it possible for anyone to make a sufficiently accurate judgment about a putting green soil or topdressing on the basis of its appearance and feel?

The soil testing laboratory located at Texas A&M University is equipped to analyze materials for comparison with the ranges currently considered acceptable for construction according to the researched and widely field tested Green Section specifications. For a preliminary inexpensive survey of existing soils, it may suffice to submit aeration core samples for a testing of infiltration rates only.

To properly evaluate a topdressing material, however, a complete mechanical analysis and testing of various physical performance characteristics will always be preferred. No one lacking full certifications as a clairvoyant can tell by feel or appearance precisely what this laboratory testing of a material will reveal. It is possible, though, for those familiar with the specifications, when assisted by a simple sieve analysis, to single out those samples widely at variance, so that only the most promising of materials need be sent on for the complete evaluation.

What is the material of choice for topdressing? Remembering that we are discussing those situations in which the surface soils have proven inadequate to support both heavy traffic and vigourous turf growth, the material of choice would most importantly be one which withstands such compacting forces so as to remain well aerated. It will also be: (2) well drained, with a good infiltration rate; (3) capable of modest nutrient and water retention; (4) firm, but not hard, when in place; (5) free from weed or disease contamination; (6) easy to handle; (7) lacking any significant amount of oversized particles, those difficult to work into the turf surface; (8) readily available into the foreseeable future; (9) uniform in composition, both within each load and from load to load; and, (10) relatively inexpensive. In other words, this is a very special sort of material which should only be selected after a thorough investigation that absolutely should include the special laboratory testing mentioned already.

The ideal material would conform in every respect to the Green Section specifications and would be ready to apply as delivered. The next best situation would be to so process the delivered materials as to obtain a mixture which conforms. This may involve but a simple screening operation to remove oversized particles, or it may require the more exacting process of blending materials according to a specially prepared laboratory formula.

Finally, there is the so called sand topdressing program which has come into prominence. Here it is worth noting that mixes which conform to Green Section specifications are also technically in the sand textural category. What we are really discussing then is the use of a sand which differs from the specifications in but two measurable criteria; an infiltration rate faster than the maximum suggested and a water (and nutrient)

Continues on page 47

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