KEYS TO FINANCING A BUSINESS EXPANSION

By Rod Bailey, President, Evergreen Services Corp., Bellevue, Washington

Finding capital to finance expansion of a small, successful business is one of the major challenges faced by the "green industry" in today's economic environment. Financial institutions are highly tentative about our industry because of their previous experience with it and because of lack of knowledge of the industry now and its challenges and opportunities.

Your response to the situation should include four areas of activity. First, **educate your banker about our industry.** Obtain, read, and give your banker a copy of ALCA's reports I and II titled, "Landscape Contracting Today and Tomorrow." We have found this tremendously helpful in broadening our banker's visibility and knowledge about our industry. Also, obtain and compare yourself to industry statistics on operating costs and financial performance. This will give both you and your banker additional perspective on the industry and your place in it.

Such data has been accumulated by several trade associations including the Associated Landscape Contractors of America (ALCA) at 1750 Old Meadow Road, McLean, Virginia 22101; American Association of Nurserymen (AAN), 230 Southern Building, Washington D.C. 2005; and the Horticultural Research Institute (HRI) also at the above Washington D.C. address. Most banks have access to their own industry data, but it is limited in scope for the green industry. ALCA and HRI data is more relevant to the landscape contracting and wholesale growing segments of the industry and firms compare more favorably to this data.

We have found that membership in the national or state trade association which is most relevant to your operation is highly valuable. The associations have much relevant published data and sponsor a growing number of specifically targeted management seminars. This is an excellent way to upgrade our industry and personal professionalism.

Second, **develop a business plan.** This is essential and should be developed in your own terms so that you know where you are going and can convince sources of financing that you do. The plan should include a description of what you plan to do to expand, how you plan to do it operationally, how much money is required to finance it and, finally, how you plan to pay it back.

Third, **obtain qualified help to express your financial plan.** If you don't have the knowledge to work with the facts and figures yourself, retain the services of a qualified local accountant or consultant who can organize an efficient accounting system with periodic financial reports. With his help convert your operating plan to its financial implications in the form of cash flow projections, projected income statements and projected balance sheets. This will be some of the best money you ever invest in your business.

Bankers or any source of money, including yourself, will need to be convinced that you know where you have been, where you are now, where you are going, and that either you personally or your business will have the ability to repay loaned or invested funds. Your ability as a manager and your ability to demonstrate it are of great importance.

The U.S. Small Business Administration has many "how to" publications covering the above subjects for the small businessman. These should be available through your closest SBA office and are valuable sources of information. Small business counselling assistance is also available through the SBA.

Finally, after you've done your own homework, **go looking for sources of financing.** These can include yourself, by remortgaging your home or other borrowing, a commercial bank who sees the merits of your presentation, relatives or friends who believe in what you are doing, the Small Business Administration either directly or through a guaranteed bank loan, or a venture capital oriented Small Business Investment Corporation (SBIC). The sources you choose will be influenced by whether you are looking for debt financing, equity financing or combinations of both.

MAKE WAY FOR DIESELS IN TURF CARE EQUIPMENT

By Thomas M. Carter, Manager of Engineering, Turf Products Division, Jacobsen Manufacturing Company

Fuel-thrifty engines that deliver high torque, greater life expectancy, and are easy to maintain are about to make inroads as power units for smaller turf care equipment.

Small displacement diesels, in the 20 horsepower vicinity are on the way, promising highly attractive power alternatives to users who have tougher requirements.

Up to now, these smaller turf machines have been powered by gas engines, traditionally air cooled units but more recently optional water cooled plants which are introduced to provide turf men with the added life that lower rpm's, cooler operating temperatures and higher torque can mean.

Diesel technology has never been very far away. Across the turf over on the highway, diesels have long been the accepted power for hauling tons of products and passengers.

Truck and bus diesels generate enormous torque, little horsepower, but extreme longevity. Greyhound gets up to 600,000 miles out of its diesels before major overhaul.

Torque rating, rather than horsepower, is a characteristic worth considering. Torque is sheer twisting force. It comes on at a much lower rpm level than horsepower. High torque rating let the big automotive engines of the 1920's and 30's accelerate from a crawl to 80 mph in high gear without hesitation. It's the performance measurement that for years has been overshadowed by horsepower ratings.

In recent years, diesel technology has advanced considerably, particularly engine speed. Older diesels could produce great amounts of power within a narrow rpm range. This left truckers and bussers doing a lot of shifting to get their rigs up to speed. But this somewhat constant rpm characteristic was hardly suitable to automotive use. Thus came the very recent development of small diesels that rev from idle all the way to 5500 rpm, such as used in the Volkswagen Rabbit, GM's Oldsmobile, etc.

The small turf diesels, however, rev lower than the new automotive units. The turf power plants are designed to produce ample power within a lower and narrower speed range, with torque coming on strong at about 1600 rpm (compared to about 3000 rpm for peak horse power in a similar gas engine).

Plenty of power at lower engine rpm's is an important diesel feature for turf applications, since these machines are operated at a fairly constant speed anyway. In addition to longer engine life, the lower speed means less fuel is consumed.

Diesels are different from gas powered engines in other respects. For one, there is the method of ignition. While gas units use a spark to ignite fuel, diesels rely on very high compression (encouraged by a heat plug for starting) to generate heat to ignite the fuel. Typical diesel compression ratio is about 19 or 20 to 1, compared to about 8 to 1 for a gas engine. The high compression necessitates a huskier engine design, from the crankshaft and its bearings right up through combustion chambers, cam shaft, valving, etc. This method of ignition also means diesel uses no spark plugs, points, coil, condenser or other elements needed to fire a gas engine.

The simplicity of diesel ignition obviously translates to simpler maintenance procedures and none of the costs encountered in replacing gas ignition system components. It's a safer engine, too, having no wiring, etc., that might short out and cause a fire.

Fuel delivery is different, too. Thicker in consistency than gas, diesel fuel is injected into the combustion chambers rather than sucked in by the

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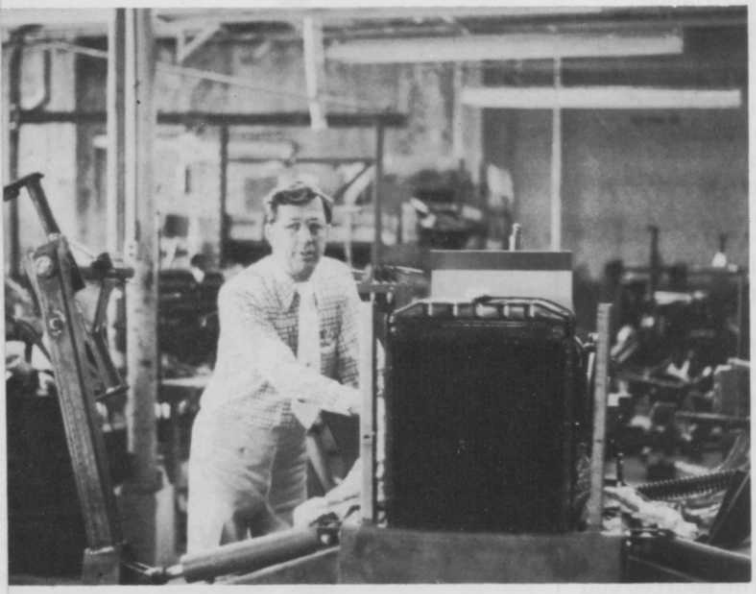
Thomas M. Carter, Manager of Engineering, Turf Product Division, Jacobsen Manufacturing Company, has made a career of engineering turf, agricultural and related equipment. At Jacobsen, he is responsible for the design and development of new turf products, enhancing current equipment, field and in-plant testing, experimental programs, and cost analysis and comparisons.



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down stroke of a piston via a carburetor. In terms of routine maintenance, these injector systems are considerably more simple than carburetors, requiring little or no adjustments. Normally, only fuel and air filters require periodic replacement. The fact that diesel fuel can't be bought at every filling station should not present a problem for turf people, since they usually obtain fuel in bulk for storage.

Other drive line components, clutch transmission, etc., are much the same as they are for a similar gas unit. Likewise for the cooling system. The generator, really needed only for lighting and to keep the battery charged for heat plug starting, would be a lower capacity unit.

Translating these benefits to actual applications, it's easy to see why diesel power will gain favor.

Take, for example, the landscape maintenance field. This is a high-growth industry that has become quite sophisticated over the past decade. Contrary to the image of a pickup truck, a couple of mowers and laborers to push them, the commercial landscape maintenance operation contracts with municipalities, utilities and industrial parks to keep the grounds in prime shape year after year.

To these entrepreneurs, time is money. They're in the business of maintaining attractive settings, on a contract basis, and this means machines must be reliable, simple, economical, and have a long life — in addition to doing their primary job well. Just as in a production plant, when equipment is down, manpower is wasted and production is lost.

Landscapers represent the production-oriented end of applications. But other segments are changing, too. As budgets tighten, a greater emphasis is placed on performance by golf superintendents, park district supervisors, cemetery maintenance people, and others. And this calls for equipment that measures up to the same performance criteria.

Another change among users generally is the tendency toward less equipment maintenance. Certainly, many have well-qualified mechanics on hand to undertake routine work, and some distributors maintain facilities and staffs. But, in the interest of keeping the machine going, maintenance is sometimes overlooked — changing plugs and points, replacing the air cleaner, redoing the head, and so forth.

Longevity is an important adjunct to performance. Users need equipment that will go well beyond the traditional one season of extensive use before valves may need attention after 500 to 750 hours of heavy use. After all, these machines run for many hours, often operated by personnel who are not mechanically inclined.

Seasonality plays an important role, too, with year-around use for some regions and six months for others.

Diverse operating conditions call for engineering a very high degree of self-preservation and long life into equipment. This is why Jacobsen introduced its four-cylinder water cooled gas engine as an option to the Out Front Commercial — to extend life through cooler operating temperatures — and why the next step to diesel power for smaller turf equipment is being taken to multiply engine life another three to four times.

Generally, the diesel will cost users more at the outset, but deliver healthy returns on investment during a more rigorous operating life. By present and foreseeable standards, emissions are less of a problem.

Not that diesels have been unknown to the industry. Diesel power has been an alternative to gas engines in the larger turf tractors for about the past decade. These machines, almost agricultural in size, are used for such heavy duty work as pulling large gang mowers that cut swaths up to nearly 20 feet, or pulling large aerifiers, seeders and the like. They ply the turf at golf courses, recreational and other large areas where using smaller units would be impractical.

Jacobsen now offers diesel power in five turf tractors. They use 192 cubic inch displacement (CID) engines that produce 65 hp at 2400 rpm, and 160 ft. lbs. torque at 1600 rpm. Running with 16.5 to 1 compression, these four cylinder power plants are manufactured to our specifications by Ford.

Just as in the automotive industry, we see diesel engines gaining wider use in the turf care industry. With the availability of the small diesel, the trend can only accelerate over the coming years.

Can Exhalt®800 cut your fungicide cost in half?

Many turfmen say yes. Our lab tests confirm it. Don't you at least owe it to yourself to spend three minutes reading the story?

For years, fungus disease control has been a source of trouble, frustration and expense. The problem is not the fungicide itself, but the application: how to keep it in place despite torrential rains and irrigation. The problem is wash-off.

That's why the development of Exhalt800 is a milestone of progress in the turf world. Here's the story:

Unlike many sticker-extenders that give little help, Exhalt800 encapsulates every fungicide particle with an armor of protection . . . a sticky, flexible "fabric" that clings to turf and foliage, essentially on contact. Yet it flexes and "breathes" to allow normal plant growth.

Because Exhalt800 keeps much of the fungicide in place, even in extreme weather, it can double or triple the control period. Even if it rains an hour after application, you'll still have effective control (see test chart), with less wash-off and less build-up of residue in soil.

Using Exhalt800, you may save 50% or more because you will need fewer sprays, you will use less fungicide with each, and reduce labor costs proportionately. Meanwhile, you can be confident the disease won't flare out of control. The evidence is clear.

In university field tests using leading fungicides, Exhalt800 added to spray tank at minimum-label recommendations gave control equal to higher recommendations without Exhalt800. With higher Exhalt800 dosages, you can double or triple the control period. Results can vary with the kind of fungicide used.

Exhalt800 costs little because it goes far (mix one pint with each 100 gallons in spray tank). Won't damage turf, trees and ornamentals when used as directed. Easy to use: add to spray tank and agitate. Easy clean-up: rinse equipment with water. If frozen in storage, Exhalt800 won't separate; may be thawed and used.

Too good to be true? The question doesn't surprise us. Compared with its competition, Exhalt800 *is* hard to believe. To know the truth, you should test it. On a golf green. A fairway. On any fungus-infested lawn or foliage.

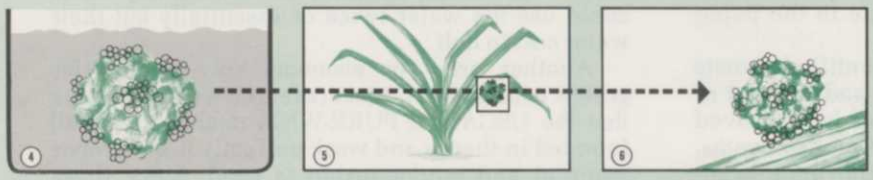
As an efficient manager, can you ignore the overwhelming evidence? See your Gordon distributor for information, prices and technical assistance.

A closer look at Exhalt®800 — the reason it works

1) Microscopic particles of fungicide are suspended in water in spray tank.

2) One minute fungicide particle, greatly magnified. Countless millions of such particles in water become the spray solution.

3) Exhalt800 liquid enters spray tank. Hydrophobic (repelled by water), it breaks into a myriad of tiny droplets and attaches to fungicide.



4) Tiny Exhalt800 droplets form a porous, flexible "fabric" that encapsulates each fungicide particle (enlarged to show detail).

5) Turf, when sprayed, becomes coated with millions of fungicide particles, each particle encapsulated within the porous "fabric" of Exhalt800 droplets.

6) Encapsulated fungicide particles on blade of grass (magnified portion). The Exhalt "fabric" around each particle is porous and flexible; it lets plant "breathe", flex and grow, releases fungicide slowly.

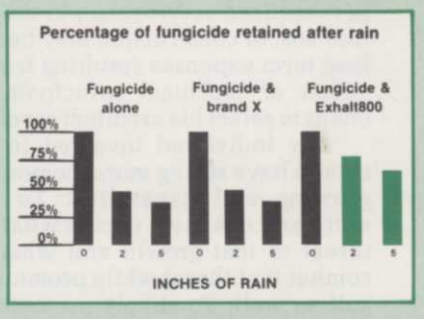


Chart shows how Exhalt800 resisted wash-off in a laboratory test. Spray coatings were applied to glass panels and dried 10 minutes at approximately 70° F. Retention after erosion by rain was measured by solvent stripping the panels and determining the residual fungicide by quantitative ultraviolet spectroscopy.

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MORAL COMMITMENT, CONSERVATION WITH TURF URGED BY BOARD

Michael J. Hurdzan, Ph.D.

Michael J. Hurdzan, Ph.d., is a partner in the golf course architectural firm of Kidwell & Hurdzan, Inc., Columbus, Ohio. Hurdzan grew up around a golf course where he served as shag boy, caddie, and then greenskeeper. During college he owned and operated a landscape maintenance company in Vermont. He joined Jack Kidwell in 1970 to form the architectural partnership.

Hurdzan received his Masters and Ph.D. degrees in plant science from the University of Vermont. He is currently enrolled in the landscape architecture program at Ohio State University, Columbus.

He is a member of the American Society of Golf Course Architects and the American Society of Landscape Architects. He is currently writing a book on the history of golf course architecture.

"The current state of golf course architecture is that more men are attempting to practice golf course design in a period of declining golf course starts. Consequently, the competition between designers is keen with the client receiving more personalized service than in the past. Since the initial cost of construction may be small compared to long term expenses resulting from improper application of technical principals, it behooves the client to select his architect carefully.

Any individual involved in the golf industry should have strong moral committment to keep golf growing and expanding. To honor that committment, one must decide what poses the greatest threat to that growth and what must be done to combat that threat while promoting the pleasure of golf as well. To simply promote golf will not suffice. Then, what are the threats to the expansion of golf and how may the golf industry in general, and the architect specifically, contribute to the popularity of golf?

Perhaps the two most easily identified threats are the time required to play golf and the cost of golf. Although, the time to play golf has received much attention, it may not be as serious as it seems. To take half a day to play golf is equivalent to going: skiing, hunting, fishing, card playing, hiking, camping, swimming, etc. Lots of leisure activities consume as much or more time than golf and many times without the benefit of sunshine and fresh air. But efforts should be made to reduce playing time, if possible, by designing shorter golf courses, scenic but less hazardous holes, fewer unmaintained periphery areas that receive much golf activity (slick side areas in particular), or one of a hundred other suggestions printed in articles in the last couple of years. The golf pro and superintendent actually have more influence over playing time than does the architect.

However in matters of costs, the golf course designer has great influence. When a golfer talks of the high cost of golf, one of the items first mentioned are greens fees that may run from $6.00 to $15.00 for 18 holes. There is real danger that if the cost of new construction and maintenance does not level out soon, and greens fees inflate, then golf may again become a rich man's game. This would be a tragic loss to the spirit of the game and to the industry.

How then, can we help reduce construction and maintenance costs and ultimately the cost to the golfer? Golf courses should have as many of the built-in minimum maintenance and artistic features as possible. But, since these features are costly, there must exist a compromise between total construction cost and the number of features. For example, in many areas of the country, bluegrass can go 14-20 days without water before it shows declining vigor. This desiccated turf once watered satisfactorily, recovers and can go another 10-14 days before showing drouth symptoms. Thus, it may be that with ordinary rain patterns of once a week, that bluegrass fairways would require supplemental water only five times a year depending on soil types and mowing heighth of the turf. Installing a manual fairway irrigation system instead of a fully automatic system may reduce the initial construction cost by $40,000 to $100,000 depending on the system. Also, many parts of the country have already experienced water shortages and golf courses are the first to be denied. In these areas, irrigation needs and water availability must be analyzed, for to specify a first rate system with limited or no water available may be wasteful. The American Society of Golf Course Architects Research Foundation, recently made a grant to the Universtiy of Florida to study golf course use of waste or recycled water. If a system using recycled water was developed, the clubs buying city water could use the water twice or essentially cut their water cost in half.

Another area for economy may be interior greens construction. Most research would indicate that the USGA and PURR-WICK methods are well founded in theory and work perfectly if the proper material and workmanship is used. Since these greens construction methods are so precise, much hand labor and very special materials are required with a resulting increase in construction cost. In the midwest, another type of green is being built that may not stand the rigors of scientific testing as well, but they grow excellent turf, rarely need to be aerified, and cost about $60,000 less for 18

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greens. This savings may make the difference between a golf course being built or not.

A reduction in the use of exotic or expensive materials may result in substantial savings that can be passed on to the golfer. More experimentation needs to be done with organic soil amendments such as rotted sawdust, leaf mulch, ground corn cobs, etc., to replace the sometimes costly and unavailable organic peat. Organic peat delivered to a job might cost $15.00 per yard while well-rotted sawdust might cost $3.00 per yard. This $12.00 savings times the 1,000 yards required for an 18 hole course is another $12,000 not spent.

Construction of golf courses on suitable but inexpensive land can provide golf at a reasonable cost. These areas are usually flood plains, areas under airport flight paths, industrial right-of-ways, preserved or unused park land, or long-term lease land. By reducing the high cost of land acquisition, low-cost golf can be enjoyed and still be profitable for investors. The architectural features must reflect the problems of the site, even if it means a loss in aesthetics.

The golf course architect of tomorrow must not only be an artist and applier of developed technology but he must also become an innovator in reducing the rising costs of construction and maintenance. The accomplished designer is not one who takes a superb site and an unlimited budget to produce a great golf course capable of hosting the U.S. Open. Rather, the truely talented designer is one who can take a poor or marginal site and a low budget and produces a golf course that provides hours of pleasure to hundreds of people at a low cost. The man who can do this has indeed proved his professionalism, expertise, and talent; and honored his commitment to keep golf a popular game for all people. **WTT**

Robert C. Shearman, Ph. D.

Dr. Shearman was appointed extension turfgrass specialist and assistant professor of horticulture for the University of Nebraska, Lincoln, in 1975.

Shearman's research includes turfgrass breeding and stress physiology. He has written numberous articles for trade publications and has spoken at major industry shows across the U.S.

Shearman received his Ph.D. and M.S. in turfgrass physiology and management at Michigan State, where he was a research assistant. His B.S. was earned at Oregon state University.

Shearman is an advisor for the American Sod Producers' Association. He is a member of the American Society of Agronomy, the Crop Science Society, Nebraska Golf Course Superintendent's Association, and the Nebraska Turfgrass Foundation.

He and his wife Linda, who also has a degree in agronomy, have two children.

Since the onset of the energy crisis there has been a growing awareness for the need to conserve energy, water, and other natural resources. Along with his awareness, increased emphasis has been placed on the production of food and fiber. These developments have cast an unfavorable image on the turfgrass industry, relating turf as an ornamental or aesthetic crop rather than the functional plant material that it is. Many of us have become submissive and have accepted this negative approach as reality, when in fact we should be on the offense.

Aesthetics are an important aspect of turfgrasses and allied plant materials, but the functional aspects of these areas are equally or more important. Numerous articles have been written that support turfgrass contributions to the environment and individual's physical and mental well-being. In addition, turfgrass research has advanced rapidly in the last 25 years. We are growing more sophisticated as a science in our knowledge of turfgrass plants, culture, pest management, and breeding. As an industry we are keeping pace or exceeding other agricultural industries in our efforts to reduce energy and water consumption.

Turfgrass science and culture is not without problems. This is what makes it interesting. There is a growing emphasis for low maintenance grasses and cultural systems for low maintenance areas. In many areas water quantity and quality are becoming more critical. Improved drought and salt tolerant grasses as well as better understanding of water management are needed for these areas. Government regulations are more restrictive and have limited the scope of available pesticides for pest control. A greater emphasis must be placed in the future on pest management, efficient use of pesticides, and development of resistant turfgrass cultivars.

Present trends in this country will continue to place an emphasis on the need for conservation of energy, water, and other natural resources. Smaller homelawns and multiple dwellings are likely to be the case in the future. More turfgrass areas will fall in the low maintenance category. Population and leisure time will increase, while the availability of land for expansion of turfgrass facilities will decrease, necessitating intense management requirements on some parks, golf courses, and athletic fields. Research efforts for the future will have to address both of these problems, as well as strive for a more basic understanding of turfgrasses. The turfgrass manager will be forced to become more technical and sophisticated in his efforts to develop cultural systems. **WTT**

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *I'm in the lawn care business, applying fertilizers, herbicides, pesticides, etc., to commercial and residential lawns. In researching and attempting to improve one-application response to lawns that have a normal six-to-seven month growing period, is it best to have three or four applications during the year? Also, what are maximum levels of nitrogen, phosphorus and potassium per 1000 square feet? What trace elements show the best response?*

A: Fertilizer requirements can be supplied in any number of applications by varying the soluble: insoluble nitrogen ratio. Thus, the required number of applications is dictated primarily by the proper timing for the pests you are programmed to control. Most lawn care companies in the northern states have found that four applications provide the most effective pest management.

The optimal level of nitrogen will vary with the grass type, soil conditions, etc., but, in general, 3.5 to 4 pounds per 1000 square feet is sufficient. Phosphorus and potassium levels are more variable and should be determined by soil testing and turf response.

Micronutrient deficiencies may occur, particularly in alkaline or sandy soils. Iron is more often deficient than any of the other trace elements, but this should be determined by foliar analysis and confirmed with test plots.

Q: *Last year our company stripped 10,000 square feet of lawn and replaced it with bark mulch two inches deep and a planting of rhododendrons (Rhododendron maximum) and red pines (Pinus resinosa). We are now being plagued with tremendous grass and weed growth. We have applied weed and grass killers to no avail. Do you have any suggestions?*

A: A black plastic film laid down before the organic mulch is applied will significantly reduce the potential for weeds.

For pre-emergence control of annual grasses and broadleaf weeds in mixed red pine and rhododendron plantings, you might try Dymid or Enide. If the ornamentals are not interplanted, you could apply Simazine to the soil around the red pines, and apply Casoron to the soil around rhododendrons.

For post-emergent control, you can't beat Roundup for non-selective control.

PROSCAPE

By Michael Hurdzan, Ph.D., golf course architect and consultant

Q: *We plan to reseed our tees and fairways to bluegrasses. Which ones are best?*

A. The precise "best ones" for your tees and fairways depend on the effective climate of your golf course, properties of the soils, and your management operation. Although there are many improved bluegrasses on the market, some appear to be better adapted to certain cultural conditions than others. By analyzing the cultural conditions on your golf course and seeking test results or field experience produced under similar conditions, the best ones will be evident.

The effective climate of your golf course is the total spectrum of limiting growth or survival factors such as high and low temperature extremes, associated relative humidity, air movement, altitude, sun angle or facing slopes (north or shade slopes vs south or sunny slopes), and the surface and subsurface drainage. An intelligent integration of these factors will indicate which experiment station or turfgrass evaluation site is most like your course.

It could be that if your course is on the north side of a Tennessee mountain that a turfgrass test area with the effective climate most like yours is found in Michigan. Similarly, there are areas in river basins of Kentucky that could get their most meaningful information from Georgia. Plants do not respond to state boundaries but rather they react to a multiplicity of environment factors. After assessing the climate, blend in the growth permitting properties of your soils including drainage, the chemical, and the physical characteristics of the soil.

Since soil modification over areas as large as tees and fairways is impractical, the turf cultivars selected should have proven ability to grow vigorously in your soils. If such information is not directly available from a research site, check with other turf managers near you that may have similar cultural conditions that may have some experience with the cultivar that interests you. However, the most reliable procedure is to put in a small test plot or several plots and evaluate the cultivars yourself.

Q: *In order to insure turf and planting compliance with government contract plans and specifications, with very limited inspection, what techniques, procedures, and recommendations can be given?*

A: I do not believe that there is any substitute for inspection. We have consistently found that the quality of the work received is directly proportional to the inspection that we give it and thus we base our fee on providing that inspection. If for some reason you can not provide that inspection, then require the contractor to guarantee his work for at least one year and have him provide the owner with a maintenance bond.

On golf courses we require the contractor to produce "an established stand of grass in those areas where he can irrigate" as part of the specifications and his contract. This means that the contractor shall provide post-planting care that may extend for 6-8 weeks past germination. The contractor uses the owner's equipment, but he is required to water, fertilize, and mow as needed during this period. When the contractor must guarantee the results, he finds it is cheaper to adhere rigidly to the plans and specifications no matter how often he is inspected.

Q: *Sand base turf fields for sports require repeated topdressing with sand similar to that used for the base construction. To my knowledge, there is not a spreader on the market to apply such quantities of sand uniformly. A large seed drill, converted to a spreader with reinforced box and a central floating wheel and tire to displace some of the load would do the job. Although the demand is there, no one seems interested in meeting it. Do you know of anything to fill the bill?*

A: I do not know of anything, but your idea sounds interesting and may work very nicely and inexpensively if you can find an old seed drill. If you should decide to build such a spreader and you are satisfied with it's performance, please send us some pictures so we pass it on to our readers.

Although there are good small topdressers available on the market, many turf managers still find that they do not fill their specific requirements. This dissatisfaction with factory models is a result of widely varying attitudes about type, consistency, and dryness of the topdressing mix and the amount that each manager wants to apply. For this reason I doubt that any one topdresser would be acceptable to all people. However, several other suggestions of equipment used by others may spark an idea for you.

An old lime spreader is used by some, with and without modifications. This unit usually has a strong materials box and undercarriage and only wider, flotation tires are needed for turf use. Some have tried rotary attachments to small dump trucks similar to those used in road salting operations (with much greater capacity, though) and thus spread pure sand right from the truck. Others are using a pull type, rotary spreader equipped with a "sand ring", only filling it about ½ to ¾ full to keep it stable and reduce compaction. When using the sand ring, some superintendents use the unit as is, some use the deflector shield to limit throw to 18-20 feed wide, and others have modified the spinner by either lengthening or shortening the impellor or spinner arms depending on the materials and the result that they want. **WTT**