
One of the best ways of overcoming the potential problem of equipment on a too-wet course is the use of fertigation.

- * Maintenance building completed and stocked.
- * Assistant superintendent, mechanic and crew hired.
- * Grow-in material and equipment ordered or on hand.
- * Realistic budgets established.
- * Soil tests completed and pre-plant amendments and fertilizers applied based on results.
- * Irrigation system pressurized and checked and procedures established for cleaning and flushing heads and supervising field clock operations.

From this list, the item that seems to pose the greatest challenge is the establishment of a realistic first-year budget. More often than not, there are omissions in the budget that become cash flow surprises during the grow-in phase.

Some of the most often overlooked first-year budget items are:

- * Additional erosion and sediment control.
- * Additional sod.
- * Additional drainage work.
- * Additional irrigation heads for unanticipated dry areas.
- * Additional fertilizer.
- * Clean-up of rough areas.

Careful budgeting the first year can eliminate financial surprises that may necessitate delaying the purchase of some other important item—such as equipment—until the following year.

Critical Water

Coordinating the amount of water and fertilizer applied to a developing golf course is very important—especially during the first eight to 10 weeks following seeding, sprigging and sodding. In the first two weeks, the course requires the heaviest and most frequent water applications. The objective is to keep the top half inch of the soil consistently wet to encourage seed germination or rooting of sprigs or sod. Unfortunately, the need for heavy irrigation during these critical weeks often causes erosion problems. Careful monitoring can eliminate runoff wherever possible, but erosion and sediment control measures are still likely to be necessary. Most easily done with silt fence, this type of control can also be accomplished with hay bales or mulch. In some instances, selectively sodding erosion areas is cost-effective and produces quality playing surfaces more rapidly.

Once the first two weeks are over, irrigation frequency can be reduced and the

young grass plants hardened for a maintenance-type irrigation schedule.

Fertility Programming

During the first two weeks following planting, it is also time to launch a well-planned and well-executed fertility program. One of the keys to a first fertilization is whether the course is dry enough to support equipment without sustaining significant tracking. This can be tough in light of the fact that this feeding generally corresponds with the time the young plants need the most water. Repairing tire ruts is not only no fun, but also labor intensive and therefore expensive.

One of the best ways of overcoming the potential problem of equipment on a too-wet course is the use of fertigation. Applying nutrients through the irrigation system allows for total control of fertility programs and permits feeding on an as-needed basis instead of having to wait for the course to dry. It is also a great labor-saver.

Most new golf course operations using fertigation can justify the cost during the grow-in phase alone because of the convenience and the control it offers. The grow-in phase can be handled almost exclusively with fertigation if adequate pre-plant applications were made.

It is not uncommon, especially when the young turf is sprigged bermudagrass, to fertilize every five to six days during the first few weeks. After four to six weeks the frequency is reduced. In extreme Southern conditions, one of pound nitrogen per week on sprigged areas is very common for the initial six to eight weeks to encourage the most rapid establishment.

Some feel this is excessive, overly expensive fertilization, but remember that it is laborious and expensive to fix erosion problems caused by slow turf development. The faster you establish the turf, the fewer the erosion problems. Increased fertilizer costs usually more than offset the reduction in

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Bunker sodded and ready for sand.

As turf establishment progresses, mowing frequency increases and fertilization and watering decrease.

Golf Course Grow In

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costs for filling, leveling and patching eroded areas.

Time to Mow

As the turf begins to mature, it is time to begin mowing. Once again, the course needs to be dry enough to accommodate equipment and, with mowing, there is no equipment-free solution like fertigation. As turf establishment progresses, mowing frequency increases and fertilization and watering decrease. These three areas must be coordinated to allow the plants to mature and harden and also to encourage deep rooting.

Mowing height should be low enough to encourage rapid and aggressive lateral growth, but not so low that the tender crown areas of the plants are damaged. The crown area is very susceptible to damage at this point. At this stage, the tendency is to mow too high. This can create spindly plants, inhibit lateral growth and affect overall turf density.

Let's Roll

Another area of concern during the first couple of weeks of grow-in is the sod on collars and the perimeters of bunkers and tees. To insure smooth transition in these areas, begin rolling within a week or two after sodding. The smoothing process is maximized if there is some, but not excessive, soil moisture (figure 3).

With collars, the rolling operation should extend onto the edge of the putting surface to create a smooth transition from seeded or sprigged putting surface to the sodded collar or green perimeter. The sod must be "keyed in" to make the transition between these two areas absolutely smooth. Rolling greatly enhances this process.

There's More

Once a comfortable routine of watering, fertilizing and mowing has been established, there are other important preparations on the path to opening day. The

following is a list of what needs to be done.

- * Maintain erosion and sediment control and keep catch basins clean.
- * Continue to monitor and reduce irrigation frequency to achieve a maintenance-type schedule.
- * Continue to monitor fertilization to keep the turf growing laterally, but maintain a balanced fertility program throughout the late grow-in stage.
- * Begin fixing and leveling problem wash areas as surrounding turf grows in.
- * Continue to roll greens, tees, collars, and tee shoulders as needed for firming and smoothness.
- * Begin topdressing tees, greens, and collars.

A common mistake often made during the grow-in phase is waiting too long to begin topdressing. Topdressing during grow-in encourages lateral growth and creates smoother playing surfaces. The most successful courses generally topdress six to eight times during the first year.

Dense Turf ... Now What?

Once a course has a strong, healthy, dense stand of turfgrass, it is time to shift gears and establish a more maintenance-oriented operation. By now, irrigation should be strictly on an as-needed basis. Deep, infrequent waterings are the key to deep rooting and maximizing the ability of the plant to harden off.

Plants must also be hardened off through proper fertilization. During the late stages of grow-in, it is a good idea to test phosphorus and potassium levels and establish an application plan for these nutrients to carry the turf through its first stress period. Also at this time you may want to make lime or sulphur applications to further adjust the soil pH.

Now that the course is almost ready to welcome its first golfers, you should set cutting heights to establish contour mowing patterns and quality playing conditions. If grow-in type of equipment is being used, now is the time to switch to normal maintenance mowers to promote a finer fairway cut.

However, prior to using a finer quality mower, it's a good idea to brush fairways with a three-point-hitch street sweeper brush to help pick up and windrow sticks or rocks remaining on the surface. This debris may not be damaging grow-in equipment, but it can definitely do harm to the more delicate, higher quality cutting units.



Superintendents must guard against erosion from adjacent property.

Once the turf is mature, all erosion and sediment control devices should be removed. This includes retrofits on catch basins. If necessary, now is the time to put additional sod in erosion areas and stake it in place. Once the turf around a site prone to erosion is established, it becomes much easier to grow grass in the erosion area itself.

Flush-outs and drainage systems for greens and bunkers should now be checked and buried below ground. And because the flushes will periodically need to be dug up and cleaned, they should be marked with some type of metal for simple detection with a metal detector. The easiest way to mark flushes is to run a self-tapping screw through the cap of the perforated tile and mount one or two heavy, flat washers to the cap with the screw. Flush-outs should also be marked on the irrigation as-built for positive location.

Set for Success

The construction and grow-in phase of golf course development is a multi-faceted and complex process requiring careful management and planning. The operations achieving the greatest degree of success in

Learning what to expect after the contractor leaves is truly an education for all involved in golf course development.



Bud White

these phases are those with a qualified and organized turfgrass manager.

Golf course developers and turf professionals involved in their first grow-in are often surprised to learn that the golf course is only half built when the contractor leaves. Successful first-year grow-in operations set the tone for success. Learning what to expect after the contractor leaves is truly an education for all involved in golf course development.

Editor's Note: Charles B. "Bud" White is an independent turfgrass consultant headquartered in Watkinsville, GA. His company, Total Turf Service, Inc., specializes in providing technical and managerial assistance to golf courses and other sports turf facilities.

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Utility Vehicles: Going The Distance

With the variety of utility vehicles on the market today, there is surely one available that will suit your exact needs, no matter how basic or complex these needs may be. However, sorting through the number of options available can be an arduous task.

Economical vehicles for basic transportation or hauling are plentiful, offered by a number of different companies. But would you prefer an engine that lasts a long time or one that rides quietly over the turf? Are you a risk-taker who likes to drive 30 miles per hour over the greens, or is a vehicle that won't surpass 15 or 20 miles per hour more suited to you? Do you want to be able to add options later? Do you want to cruise comfortably with the radio playing? Is this going to be a knock-around vehicle that needs very little care? These questions are just the beginning. If your business requires more work from your vehicle, or one specific use, the questions you must ask before you begin your search are much more in-depth.

The research completed by *Golf & SportsTurf* has concluded that customers' interests in quality and durability have not waned. Now a trend seems to be appearing toward the desire for slower vehicles that may be safer to drive. In addition, customer interest in comfort is growing. If you're spending quite a lot of time driving around,

comfortable seats and a radio can really help the day move along.

Manufacturers continue to seek new ways to make their utility vehicles better than their own existing line and their competition's, and right now they still see economical versatility as the key. At least two companies have introduced smaller, multi-purpose models in the past few months.

"People are looking for versatility," explains Ron Skenes of E-Z-GO division of Textron. "They want their vehicles to do a whole lot of different things so they don't have to buy a whole garage full."

On the other hand, sophistication in design and construction is also more important to quality-conscious customers today, quite a few manufacturers add.

"I think people are demanding more sophistication," remarks Ron Burklund of Cushman. "They are looking for attachments, hydraulic systems, a drive train. They're definitely looking harder at vehicles before buying them. There's more interest now in heavy-duty construction."

Some companies, such as Haul Master, offer only one type of utility vehicle, a "knock-around," as Randy Fox calls it. It has no optional attachments, but it's easy to use, has comfortable seating for two, and it will carry a load slightly in excess of 1,000 pounds.

Mitsubishi, which generally concentrates on its on-road vehicles, also carries only one utility vehicle. And even this, states Bob Hurtell, is considered an on-road vehicle in countries outside the U.S.

"It's built on a production line with on-road vehicles, and it works like a pickup truck, but without the insurance costs on-road vehicles require. And you don't need a license to drive it," Hurtell explains.

"It's generally used by people operating a complex of golf courses. It's a two-seater and it can pull a sprayer. Some people use it because it will travel 25 miles per hour and it has low-compactation tires for turf. In addition, it has a tight turning radius of 12-1/2 feet and a load capacity of 1,300 to 1,500 pounds with the turf tires. It is also available with a turf bed," he adds. "Some people might choose to adapt it as a beverage unit. That tends to be a good use for it."

Columbia ParCar's Utilitruck is a very flexible utility vehicle, available with a gas or electric power, an optional enclosed cab with easily removable doors, and numerous other features. But the biggest selling point, according to Terri Tippins of Columbia ParCar, is that the wheel base is 10 inches longer than normal, which centers the rear axle under the payload. Therefore, when the box is loaded, the vehicle will not tend to tip in the back. It will remain firmly centered along the grounds. Also, the Utilitruck is easy to maneuver because of its narrow design.

Many manufacturers will be able to show you a variety of utility vehicle models. Cushman, which carries 10 models of both "work specific" and multi-purpose vehicles, is a good example. This firm's newest model is the GT America, a light-to-medium-weight utility vehicle designed for golf course superintendents.

"It has great aesthetics," notes Ron Burklund of Cushman. "It has high-flotation tires, a positive traction lock and a lot of creature comforts. It will accept a spray unit, or extra seats can be added. It's powered by an eight horse-power, four cycle engine, or a 3-1/2 horse-power electric engine, and the load capacity is 1,200 pounds. Usually, it's used for transporting people and lighter loads such as sand. And a radio is standard.

"Our Turf Trucksters are also important: The 535 is a dedicated spray unit truck that has a built-in ground spray governor. This will control ground speed accurately so the right amount of chemicals will be added. And our GA60 Aerators can aerate a fair-

Cushman Truckster,
one of ten models the
company carries.



way in an hour," Burklund adds.

"Our multi-purpose utility vehicles (MPUVs) are very diversified. They can do aeration, spraying, they have systems that can run things like core harvesters, and they have a load capacity of 2,000 pounds. We have fifth wheel implements that will haul 2,500 pounds with 10 pounds per square inch (psi). Our topwheel dresser holds about 2,000 pounds. It has a higher capacity and less ground pressure than you'd get with a trailer," says Burklund.

Dave Hardy of Club Car sees a definite trend toward the use of MPUVs. "A few years ago the trend seemed to be going toward specific-use vehicles," he recalls. "But now people want to buy one vehicle with multiple uses, mainly for economic reasons. If you buy specific-purpose vehicles, you might need more than just one."

Club Car offers three models that all come with a variety of options. The Carryall One has an 800-pound loading capacity, the Carryall Two will load 1,200 pounds, and the newest model, the Carryall Two Plus, will carry 1,000 pounds but will travel at a higher speed of 18 miles per hour. "It's made for extra speed on improved surfaces," Hardy says.

The original two models are available with gas or electric power, and an air-cooled engine. There is a torque converter transmission with a variable clutch arrangement. "You get excellent acceleration and great downshifting that way," notes Hardy.

"We have towing attachments, small sprayers—anything you can tow, you can tow on this vehicle," he adds.

"The vehicles have several different tire options. Some have cab closure attachments, or you can get hard or soft doors (that zipper) on them. We offer non-breakable windshields and a hard molded cab, wire mesh windows—the vehicles are built specifically around the driving range."

Jacobsen's utility trucks are also versatile. New models include the 2315 diesel and the 2015 gas utility vehicles. They can be fitted with a topdresser, sprayer and aerator attachments. A universal mounting kit allows other manufacturers' attachments to be used on the trucks. The diesel model comes with PTO as standard equipment. The PTO is independent of ground speed, allowing the operator to set a constant attachment speed separate from vehicle speed. The 2315 comes with a full hydraulic package and dump box. The 2015 is available with a manual or hydraulic dump.

"I think that the trend is away from



John Deere 1500 with utility bed attachment.

mechanical and toward hydraulic engines," comments Jim Byrnes of Jacobsen, "Both for economical reasons and durability. With a diesel engine you can save as much as 50 percent on fuel, plus there will be less maintenance required. The construction of the engine is built heavier. There's no ignition timing, no spark plugs."

Jacobsen also has new Express utility trucks that can move up to a half ton of passengers and cargo. These are available with gas or electric power, and both trucks have all-steel bodies.

Both models have a tubular steel chassis and can haul up to 1,000 pounds. Each has an eight-cubic-foot load box. For operator comfort, they are equipped with foam-cushioned bench seats. Hydraulic shock absorbers on all four wheels smooth out rough spots. Rack and pinion steering and an automatic torque converter come on gas models.

According to Daihatsu's Christina Gaines, two of the company's utility vehicles, the Cut-A-Way and the Jumbo Cab, are most suitable for golf courses or other sports turfs. They have gas-powered, water-cooled engines and come with a lot of the standard equipment offered in on-road vehicles. For example, roll-down windows are standard on Jumbo Cabs, as are a heater and defroster. Seat belts, horns, and guard bars or steel doors provide safety.

While the Cut-A-Way would best be used simply for transportation purposes, the Jumbo Cab is an all-weather vehicle that can be used for many jobs.

At John Deere, safety is key. "Our vehicles will not put the operator in harm's way," states Bob Tracinski of the firm. "We're very safety conscious."

The company is not only concerned with safety for the riders, however. They also are

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Jacobsen 2315 diesel utility truck.



Another can't-miss prospect from the Kansas City camp

There's another hot name in the Kansas City Royals' spring training camp this year — John Deere. Like last year, a John Deere 1200 Bunker and Field Rake is helping head groundskeeper Ed Mangan keep the Royals' Davenport, Florida, facility immaculate.

"We have 6½ fields to maintain here that wind up getting 1200-1500 games played on them a year," says Mangan. "We've got to work extra hard to handle that kind of use and still keep the fields in major league condition.

The John Deere 1200 has really helped.

"I call the 1200 my utility player because it goes anywhere and does almost any job," says Mangan. "We use it for grooming, rebuilding, and reconditioning all the fields. It's even pulled our mowers and aerators.

"It's got tremendous power. We can push or pull implements through heavy, wet clay without



Attachments such as seeders, spreaders, brushes, blades, scarifiers and rakes help the 1200 work productively on any ball field.

worrying about it stalling. Our hydrostatic rakes used to spin out with half the material the 1200 is handling.

"We also save time by never having to stop to change implements. With a blade in front, scarifier in the middle and field finisher on the back, we just drive the 1200 on a field, groom it, then lift our implements and go when we're finished. It works beautifully."

For the name of your nearest distributor, or free literature on John Deere's Golf and Turf Equipment, call 1-800-544-2122 toll free or write John Deere, Dept. 956, Moline, IL 61265. Like Ed Mangan, we know you're going to like what you see.



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Utility Vehicles

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dedicated to protecting the environment. "A number of turf car people feel they've always done well, but now we have to account for our actions," says Bill Chestnut of John Deere. "When that's the case, spray monitoring equipment is a must. Ours will make sure that each nozzle is putting out the proper chemicals. The cost of chemicals is very high, and the superintendent tries to avoid storing them. With a spray monitor, the person knows the mix and can spray out the right amount instead of rinsing."

The AMT 626 model is the one the company feels is best for the golf and turf industry. The sprayer is the most beneficial attachment, because of the monitor and because of a walking spray rig that can perform remote applications. An ulterior bracket mounts on the vehicle for transport purposes and is taken off at the green for application.

"One vehicle may be a course runabout,

but if it's a dedicated vehicle it shouldn't be used that way because it affects safety and stability," notes Bill Chestnut. "You don't want to put two people on a spray unit, which is designed to have more weight in a more repetitive fashion."

The AMT 626, which is an MPUV, can carry sand, people, or anything under 600 pounds that will fit. The AMT 2 tow-behind cart adds another 800 pounds to the total capacity.

"The superintendent will decide what he needs," says Bill Chestnut. "But you don't want to put 200 pounds of spray on the back of a vehicle and drive 20 miles per hour. It's just not safe."

Kawasaki has just started advertising its newest vehicle, the Mule 500, which is designed mainly for use as an economical transportation vehicle. The single-seat Mule 500, with a tight 10.5-inch turning radius, can maneuver in cramped quarters. The steel frame and cargo area can handle a maximum load of 660 pounds. Because of its compact size (it measures 97 inches long

by 47.6 inches wide) it can be hauled to a job site in the back of a full-size pickup truck. Operators will appreciate the adjustable seat and tilt steering wheel.

Still, this truck is just the newest and smallest in the Mule line. The 1000 has been used by the golf and sports turf industry for quite a few years, according to John Baker of Kawasaki. "That's our most widely accepted model. It's mainly been used for just getting around, or to haul sand. Often the superintendent just uses it as his vehicle. It drives like a car, it's so easy to operate, and it has a bed in the back with an optional tilt feature. Both the Mule 500 and the 1000 are very sturdy. In fact, they're difficult to break. The Mule has a simple auto transmission. Our drive is a mechanical torque converter, but it shifts itself. It's not an oil drive. It's like a mechanical automatic transmission.

"With the water-cooled engine it will last longer, because the metal won't wear out as quickly. But it can be a maintenance headache that way. You have to check it a lot. But our 2010 and 2020 Mules are air cooled, so there's less maintenance required. Also, the good suspension system helps in the durability factor."

E-Z-GO Textron has also introduced a new utility vehicle recently, the GX-804 gasoline-powered multi-purpose utility vehicle. According to Ron Skenes of E-Z-GO, what makes this one distinctive is its four-cycle, twin cylinder, overhead cam engine. The new powertrain runs cooler, smoother and quieter than single cylinder four-cycle engines, says Skenes.

The vehicle also features an eight-cubic-foot load bed with 1,000-pound load capacity, direct drive, and an automatic continuously variable transmission.

The versatile truck can be helpful for anyone working on the grounds of a field or golf course. It can pull or push ball pickers, it can carry sprayers or aerators, and it has a comfortable bench seat for easy transport. However, it's governed to run at 12 miles per hour.

A larger vehicle offered by E-Z-GO, the GXT-1500 is more of a truckster type utility vehicle, notes Skenes. It features a 20-horse-power engine with a manual transmission. It will haul up to 1,500 pounds and travel up to 24 miles per hour.

"It's used for the same applications as the GX-804, but it can haul larger, heavier objects," says Skenes. "It can pull large aerators, sprayers and topdressers, and it's perfect for moving equipment or sod."

Even with all of the multi-purpose vehi-



**Mitsubishi utility
vehicle resembles
a small pickup
truck.**