



stallation. A sandtrap rake is an ideal tool to level the sand blanket, especially when working around the grade stakes.

By this time the work force and the entire project is going to be spread out pretty far. The superintendent and heavy equipment will be working on the last green or the third green, depending upon how many you plan on doing. The tiling crew run by the assistant should be working on the second green, and the operator and laborer spreading the gravel and coarse sand will be working on the first green. Once you get spread out like this, there is a tendency to pick a couple of the men from your regular crew to help with the construction. Don't make the mistake of letting the routine maintenance on the course go simply for the sake of the construction. You still have a primary obligation to provide as good a condition as possible to the membership. If this declines, then you open yourself and everyone involved to criticism. If you need a couple of extra men and you are pushing against the weather and/or the calendar, then hire them. You should have added at least a ten percent contingency fund to the total construction budget anyway. (While on the subject of contingencies, let me say that there will definitely be some. Things such as old water lines, and tile lines, along with existing

irrigation lines and wires will have to be contended with. One good bite with a backhoe into a couple of dozen irrigation wires can put havoc into your day. Learn to take these things in stride. Broken pipes and delays due to the flooding they cause are a way of life in reconstruction, no matter how well you plan the procedure. It is the quality of a good supervisor to be able to handle these contingencies as efficiently as possible without disrupting the overall project.)

Filling the green is probably the largest single phase of the operation. Here is when you get on the phone and use the "beg, borrow and steal" method and round up four or five dump trucks from nearby courses. All of the clubs in our area have been most generous and often send an operator for a day or two. Two front end loaders can keep the trucks filled, especially after they get spread out traveling from the mix area to the green site. A small track type of high lift is ideal for handling the mix and spreading it onto the new greens. We usually rent a Case 350 for this job and it handles the material well and also does an excellent job of compacting it. Once we get it out on the green, then the dump trucks drive right out onto the fill areas and dump their load. This eliminates having to push it so far with the high lift. We have never had

any problem with compaction with the trucks pulling out on the green. With any kind of luck you can fill three greens in a twelve-hour day. Remember those grade stakes that you put in earlier? Once you have reached grade line on them, they can be pulled. It will be necessary to have a transit set up to check the final contours on the green and you can expect to take about four hours per green putting in the final contours using the tract type high lift and a tractor with a grade box. Once the contours have been established, then get the committee together to make sure that everybody involved agrees with the final shape of the greens. I have experienced a situation where we had seed germinated and changes had to be made because "someone" didn't approve of the architect's design. This, however, shouldn't be a problem if everyone on the committee knows anything at all about reading blueprints.

The next step is to incorporate the starter fertilizer and seed the putting surface. We used Penncross Bent at two pounds per thousand. Knowing the size of each green, the seed was weighed out and applied in three directions to insure good coverage. We have had our best results with lightly raking the surface after seeding and then rolling it. The green and sandtraps are then rimmed with sod, two rolls wide. This helps to define both and helps keep the proper design of the green.

We have been involved with constructing the U.S.G.A. type of green for four years and are more than satisfied with the results. If you plan this type of construction as far in advance as possible, it will eliminate a lot of problems. It can be done smoothly and rapidly. The last four greens that we built took twenty work days from start to finish, which averages out to five days per green at a cost of \$1.10 per square foot with thirteen greens now completed. This cost figure includes everything except the white sand for the traps.

If you are going to take the time to build a green, then do it right the first time. **GB**

### Answers to turfgrass insect identification quiz

A. Masked chafer adult, *Cyclocephala* sp.; B. Greenbug, *Schizaphis graminum*; C. Bluegrass billbug larva, *Sphenophorus parvulus*; D. Clover mite, *Bryobia praetiosa*; E. Hairy chinchbug nymph, *Blissis leucopterus hirtus*; F. Bronzed cutworm larva, *Nephelodes minians*; G. Winter grain mite, *Penthaleus major*; H. Southern molecricket, *Scapteriscus acletus*; I. Black cutworm adult, *Agrotis ipsilon*; J. Sod webworm larva, *Pediasia trisecta*; K. Hyperodes weevil adult, *Hyperodes* sp.; L. **Rhodesgrass scale**, *Antonina graminis*; M. Japanese beetle adult, *Popillia japonica*; N. Fritfly adult, *Oscinella frit*; O. Armyworm larva, *Pseudaletia unipuncta*; P. Black cutworm larva, *A. ipsilon*; Q. Hyperodes weevil larva, *H. sp.*; R. Ground pearls, *Eumargarodes* sp.; S. Hairy chinchbug adult, *B. leucopterus hirtus*; T. Bluegrass billbug adult, *S. parvulus*; U. Vegetable weevil larva, *Listroderes costirostris obliquus*; V. Sod webworm adult, *P. trisecta*.

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News from page 8

### PESTICIDES

#### United Kingdom says 2,4,5-T does no harm

The December, 1980 report from the United Kingdom's Advisory Committee on Pesticides stated that it found no sound medical or scientific evidence that humans or the environment would be harmed by continued use of 2,4,5-T for recommended purposes in recommended ways. The Committee's 1980 report echoed its 1979, although the '80 reviews included evidence which was not available in '79.

The report also stated, in assessing the risk of 2,4,5-T alone, with strict controls on dioxin contamination levels, that 2,4,5-T has "not been shown to cause cancer in experimental animals; that its teratogenic effects in rodents have not been demonstrated in other larger animals, or in the course of long-term studies on humans; and that in the unlikely event that it was a mutagen it could only be a very weak one, so that any possibility that this could affect any user would be negligible even if he or she neglected recommended precautions".

### STATISTICS

#### NGF survey shows play rose 4.14 percent

Paul Spadafora, National Golf Foundation (NGF) Marketing Director, said in the February issue of Golf Market Report, that golf participation in the last quarter of 1980 rose significantly over a similar period in 1979 despite adverse weather and economic conditions in the country." Reporting further, Spadafora wrote that five of the seven geographic regions in the U.S. reported fourth quarter increases, with strong surges in the West North Central and South Central regions. Total rounds increased 4.14 percent for October through December.

On a nation-wide basis, 63 percent of the golf courses survey reported an increase in play, 33 percent showed a decrease and four percent reported no change. Analyzing 1980, Spadafora projected that total play increased by 3.8 percent to an estimated 359,000,000 rounds, or 13,000,000 more than 1979. Only one region, the Pacific, registered a decrease (one percent).

Participation at private clubs showed the largest increase among the three major types of courses. Play by private golfers comprises 33.9 percent of the U.S. total. Daily fee play was second in terms of rate of increase, although it comprises 43.7 percent of the total. Municipal golf represents about 22.4 percent of total play in the U.S.



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environment. Do your golfers know that golf courses are now in the forefront of green-belt planning? Conservation and ecology groups are giving increased recognition to the importance of golf course acreage. Golf courses offer no pollution problems and have a beneficial effect on air purification. If you're still stuck for something to say, look through copies of your local association's newsletters for ideas. Most associations encourage such "plagiarism".

Too often, the club bulletin board is void of information relating to maintenance operations personnel. Like the newsletter, this is an excellent way to keep you and "what's going on" in front of your golfers. There are a myriad of ways to use the bulletin board to your advantage. Soliciting suggestions can come from the bulletin board, or, recognizing the accomplishments of your crew members. Once again, the purpose is not to win a writer's award, but to keep you and the

importance of your activities in front of the golfer.

There are constant complaints and concerns that the golf course superintendent doesn't receive enough recognition for his efforts and professionalism. Such problems will undoubtedly continue, unless more superintendents take it upon themselves, individually, to better inform the golfers who play their course. With better informed golfers comes more visibility and better recognition of the important role played by professional golf course superintendents. The trade journals and superintendent associations can help to enhance the image of the superintendent, but the major gains will come, collectively, as each superintendent does more in his own behalf.

I'm not going to ask my standard question on any business flights until next year. When I ask, "Who's your golf course superintendent? for the 23rd time, I hope the answer will be the superintendent's name.



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# Sharing ideas will help everyone cope with a water shortage

In the January/February, 1981 issue of Tee to Green, the monthly newsletter of the Metropolitan Golf Course Superintendents Association, Editor Pat Lucas called for "ideas to share" on the serious water shortage that is affecting the Northeast. In the March issue, a list of 50 suggestions was printed, contributed by 15 superintendents and concerned industry officials. The issue also contained a letter from "Old Timer" Ed Worthington, The Ed Worthington Co., whose report was "based upon years of experience coping with droughts".

In this issue of Golf Business, we would like to share those 50 ideas and Ed Worthington's letter, which reinforces many of the points.

We would like to extend a special thank you to Editor Pat Lucas of the Innis Arden Golf Club, for sharing this material with us so that we may share it with you. Thank you also, to the following, for contributing their ideas and expertise: Bob Alonzi, Fairview CC, W. Andy Androsko, Pratt-Gabriel Div., Miller Chemical & Fertilizer Corp., Mike Bavier, CGCS, Inverness Golf Club, Ted Horton, CGCS, Westchester CC, Joseph Lach, Bruce Memorial Golf Club, Frank Lamphier, Aspetuck Valley CC, Melvin B. Lucas, Jr., CGCS, Piping Rock Club, Jay Motola, Metropolitan Golf Association, Peter Rappoccio, Silver Spring CC, Bill Smart, The Powelton Club, James Snow, USGA Green Section, John Sundhold, The Greenrock Corp., John Wistrand, Metromil-organite, Inc., and Ed Worthington.

Golf Business invites all of our readers to participate in this water forum. If you have questions about how to cope with aspects of a drought, now is the time to ask. If you have developed methods of coping, now is the time to share them. It is a time to unify, for it will surely reflect credit upon superintendents whose professionalism sees them through yet another adversity. Contact me, Managing Editor Ron Morris at the harvest Publishing Co., 7500 Old Oak Blvd., Middleburg Hts., OH 44130, or phone 216/243-8100, extension 370. We will endeavor to answer all questions and share all ideas.

## MGCSAA survey results

1. Minimum nitrogen, higher potash.
2. Higher cut on greens, tees, fairways.
3. Hold back on first watering to harden turf.
4. Establish priorities on watering, i.e., greens, tees, approaches, landing areas, etc.
5. Use anti-transpirants on grass and shrubs. (Experiment)
6. **Advise membership now concerning water problems we will be facing.** (Emphasis added. Ed.)
7. Watch herbicide-fertilizer application. Use less amounts if water availability is in question.
8. More hand watering, less sprinkler use on greens.
9. Determine how much water you have to work with (capacities of lakes, ponds, etc.). Adjust watering program to possibility of not having any rainfall to replenish these amounts.
10. Omit fairway watering if necessary.
11. Capture rain water from roof gutters, club buildings for filling spray rigs, cleaning, etc.
12. Get back to old time basics of golf course management, i.e. old courses in Scotland, no water but still beautiful.
13. Consider sprigging zoysiagrass in fairway areas prone to wilt and moisture loss.
14. Use wetting agents for more uniform water profile. (Experiment)
15. Keep nitrogen at the 3-4 pound rate per year.
16. Program or apply irrigation in dawn to early a.m. hours.
17. Use soil probe to determine water need.
18. Cut less area as fairway — shorter and narrower.
19. Insist on water person timing all moves.
20. Cut down nozzle size if possible.
21. Educate water person as to desirability of "skipping" low fairway areas.
22. Use herbicides only if needed (can reduce roots).
23. **Educate your membership, write a special newsletter and follow up articles laying it on the table as to what will happen.** (Emphasis added. Ed.)
24. Re-evaluate all your water re-

Continues on page 28

## Turfgrass maintenance during the water crisis

Ed Worthington, Ed Worthington Corporation

1. Raise height of cut on all mowers to obtain additional shade, provided by the longer grass blades which will help to conserve soil moisture.

a. On golf courses, notify the membership that SLOW greens are the order of the day until the crisis is past.

c. Adjust mowing schedules so that no more than 1/3 of the length of the grass blade is removed at every mowing. This will reduce shock to the plant.

2. Your long range problem will be to retain as much soil moisture as possible under your turfgrass areas. In a water crisis, a good long SOIL PROBE can be an important piece of

test equipment. Use it daily to check localized dry spots and to find how far down is your drought zone. Start as soon as you can in the spring and try and keep it at least one foot from the surface. Dry soil works up towards the surface—reducing your ground moisture reservoir. When it reaches the root zone, your grass is in trouble. Water applied to a turfgrass area tends to move horizontally with very little vertical penetration until the thatch and ground is thoroughly wet and surface tension is reduced. Methods by which this can be accomplished are as follows:

Continues on page 26



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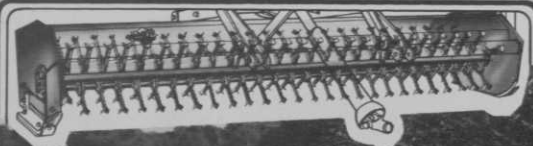
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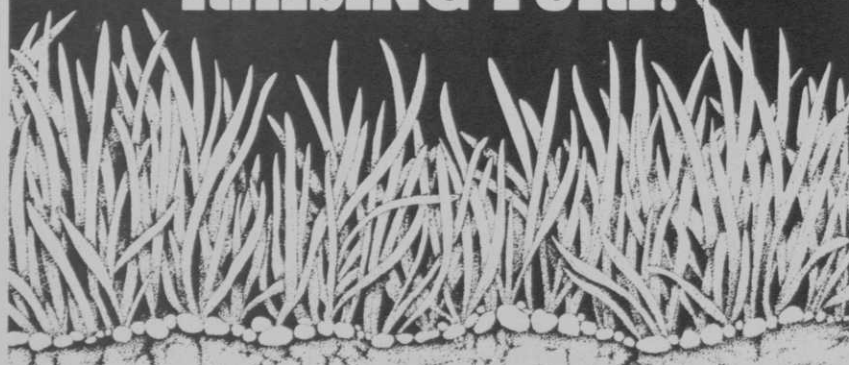
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**Crises** from page 24

a. Use a spiker at least once a week just before a rain or set up your sprinkler and use it right after spiking. The water will find a path down the spike slits through the thatch zone and charge up the ground underneath with moisture.

b. For real problem areas, use an aerifier and work the water into the holes with a hose or sprinkler. Another method would be to use a verticutting machine with 1-inch spacing on the knives and soak thoroughly with your sprinkler. Check with your soil probe on all operations.

c. Use a soil penetrant (wetting agent) to help your vertical movement of water through the mat or thatch and ground. Start early and use as directed. Chemical wetting agents, by reducing surface tension, enable water to work down in the soil, increasing the soil water reservoir or help the water work up to the grass root zone as needed.

d. Useful tools for working on localized dry spots include an aerifier with two tines about 8-inches apart and a handle to hold on to while your foot pushes the tines about 3-1/2 inches into the sod. The same idea is an air water aerifier connected to a garden hose with pointed tines that have a couple of holes in them for the water. Finally, a tree root irrigator used by arborists which is connected to high pressure sprayer hose can be useful to force water into compacted soil or for deep penetration of water or solutions.

3. At the turfgrass or playing surface, we have already listed mowing practices to reduce stress and shock at the beginning of this article. To reduce transpiration or evaporation loss, the following suggestions may be helpful:

a. Spray the turfgrass area with a liquid hydrostatic sticker which inhibits water loss and protects against desiccation. It also retards moisture loss on trees, shrubs, etc. Also, it guards against summer scald and winterkill. If this material or a green turfgrass paint is used, be sure and remove all screens in your sprayer; use tepid water in your tank solution and clean your sprayer, thoroughly, immediately after use.

b. To repair or not to repair machine damage, localized dry spots under drought stress is a good question. Instead of chewing up the area and reseeding, it may be better to spray the area with a green turfgrass paint and wait until late summer for renovation. On par 3 golf tees, reseed as needed with a fine-leaved ryegrass until late summer when a good tee mix should be substituted to form a permanent sod.

c. Mulches on non-playing turfgrass areas can provide additional shade to reduce moisture loss. However, what you use and how much can be

Continues on page 28



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few divots and those that do occur heal quickly. But, whatever the circumstances, I know when I use Tee Time products I'll get the first-class turf my job demands."

George has used a variety of Tee Time products in working with different grasses in a wide range of soil types under varying weather conditions, and he says, "In every case, they did a tremendous job. The line's so broad it's hard to imagine any situation that one of the formulations can't handle. The soil in our practice fields is clay and the drainage is very poor. Last year, with Tee Time products I got some fields in good condition in only six weeks. You'd expect a job like that to take much longer. Through-

out the season we had little rain and very high temperatures, but the grass really stood up. And, what's more, with Tee Time I was able to use only about half the amount required when using other fertilizer products."

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a tricky business. Hay mulches may introduce undesirable weed seeds. If applied too thickly, lack of sufficient light will kill the turfgrass underneath or cause disease problems. The right amount of straw would be better, as all you want to do is to provide some additional shade, keep weeds down and to let light, air and water down to the turfgrass. Still better, may be plastic netting or woven materials that will accomplish the same purpose but make sure they don't cause more problems than they are worth.

d. Watch your fertilization program carefully. Keep your potash levels up but be careful about your nitrogen. If you have been using slow release products, remember that will be released from this type of fertilizer of the ureaform type that was applied up to several years ago. So go easy. If in doubt, use a water soluble type in a sprayer and keep checking your bucket clippings on greens. It may even help to not use your buckets on your greenmowers

on a water crisis.

e. In high altitude areas, look out for spring kill (wet wilt) in late April and May. Beautiful sunny days with a breeze from the North, together with low humidity and a cold wet soil, can spell disaster. Again, a hydrostatic sticker that retards moisture loss can be very useful during this period. Otherwise, if your pipes are connected, syringe your greens from noon to 3 p.m., just as the fellows down in the valleys must do with their *Poa annua* in July and August. No water? Get your sprayer or tank truck and fill up somewhere. Then apply to those greens exposed to the northern, low humidity breezes as a syringing operation. Follow the same procedure for syringing *Poa annua* if water is curtailed in your area.

4. Chemical applications of pesticides during stress periods requires planning. Here are some suggestions in a water crisis:

- a. Fungus diseases can be a problem during any stress period. Maintain your fungicide schedule even though heights of cut on your mowers have been raised. Use only enough N to help control dollar spot. Check your pH readings and try to stay around 6.5.
- b. Insects may become a real problem. Start early on an insecticide program and keep at it. For hard to wet insects, use a spreader-sticker with your insecticide.
- c. Herbicides—personally, I never would use them during any stress period.

5. If your water supply may be cut off or reduced, now is the time to think about where you can get water that is safe for turfgrass and how to get it where you want it. Keep your eyes open for any items that might be useful. An old abandoned sprayer might be repaired to hold water. Make sure you have a small pump with suction hose, strainer and discharge hose—long enough to reach from your lake, pond, stream, etc., to your water carrier, should your irrigation system be cut off.

6. Finally, keep up on long range weather reports for your area, keep a daily weather diary, and record soil probe moisture depths around the course. Good luck and if all else fails, gather together some good Indian friends and hold a Rain Dance

- quirements.
- 25. Reduce number of rounds of golf allowed on days of stress.
- 26. Allow for the maximum recovery time of a turf area before use again.
- 27. Develop a crisis management program.
- 28. Water 5-10 minutes daily between 5 and 7 a.m.
- 29. Use sewage effluent for water source.
- 30. Night watering only.
- 31. Less frequent mowings.
- 32. Begin watering as late as possible in 1981. Consider mowing at night to reduce stress.
- 34. Water in daytime to be able to supervise and observe better.
- 35. Conserve, adjust watering down to base minimum.
- 36. Use mulches on plant materials.
- 37. Erect wind barriers where needed.
- 38. Seek additional water sources (drains, ditches, wells, ponds, marginal water, roof systems, air conditioner water, etc.).
- 39. Meter usage.
- 40. Improve efficiency of system (fix leaks, relocate heads, check nozzles, train waterman).
- 41. Minimize spring nitrogen applications.
- 42. Aerate turf areas this spring to establish good roots and ensure good water infiltration.
- 43. Keep turf "hardened" prior to summer by irrigation as infrequently as possible during the spring.
- 44. Irrigate at night when possible—less wind, lower temperature, less evaporation.
- 45. Check soil moisture and depth of roots before deciding to irrigate and then irrigate only to depth of roots.
- 46. Reduce or avoid other stress factors (insects, diseases, weeds, good traffic control and good drainage).
- 47. Consider using more organic fertilizers and less inorganic fertilizers to lower salt index and reduce need for frequent and copious watering.
- 48. If watering is prohibited, consider pump house renovations and improvements.
- 49. Communicate with and inform local golf associations, such as PGA, MGA, etc., on what effect altered maintenance programs will have on playing conditions.
- 50. Pray for frequent rains.





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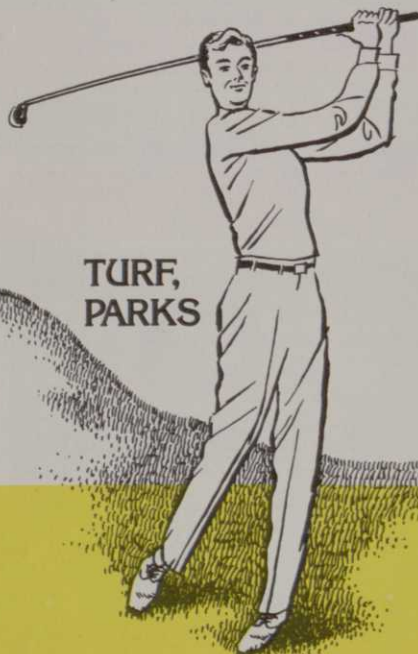
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For complete information on Sulphur Coated Urea, and how it can be economically used in your next fertilizer blend, contact your nearest Baker Representative.

## H. J. Baker & Bro., Inc.

100 East 42nd Street, New York, NY 10017

Telephone: 212-867-0200. Telex: 1-2487; 420944; 223482. Cable Address: BAKERBRO



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H. J. Baker & Bro., Inc. is sole sales agent for A.I.M., Elyria, Ohio

Write 128 on reader service card

# GB Classified

June issue closes May 8  
 July issue closes June 9  
 August issue closes July 10  
 September issue closes August 10  
 October issue closes Sept. 8

When answering ads where box number only is given, please address as follows: Box number, % Golf Business, Dorothy Lowe, 7500 Old Oak Blvd., Middleburg Heights, Ohio 44130. Rates: All classifications 65¢ per word. Box numbers add \$1 for mailing. All classified ads must be accompanied by cash or money order covering full payment.

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### ASSOCIATIONS

**Southeast Golf Course Owners Association**  
 P.O. Box 596, Lebanon, Tennessee 37087  
 (615-449-4217)

*United management development through co-operative organization. Promotion of golf course operation efficiency and service to our golfing public.*

**Michigan Association of Public Golf Courses**  
 15553 N. East St., Lansing, MI 48906  
 517/484-7726  
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**Oregon Golf Course Owners Association**  
 905 NW. Springhill Dr., Albany, OR 97321  
 503/928-8338  
*Promoting public golf and excellence in private-enterprise course operations. Any private owner in Oregon welcome to quarterly meetings. Call or write for details.*

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## GB Sales Offices

**ATLANTA:** 3091 Maple Dr., Ste. 312,  
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**BOB BEAVERS**  
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**ROBERT A. MIEROW**  
 Northwestern manager