Periodic cleaning of main drain lines may reduce flooding problems.

The Turf Management Picture in 1973 As We Saw It

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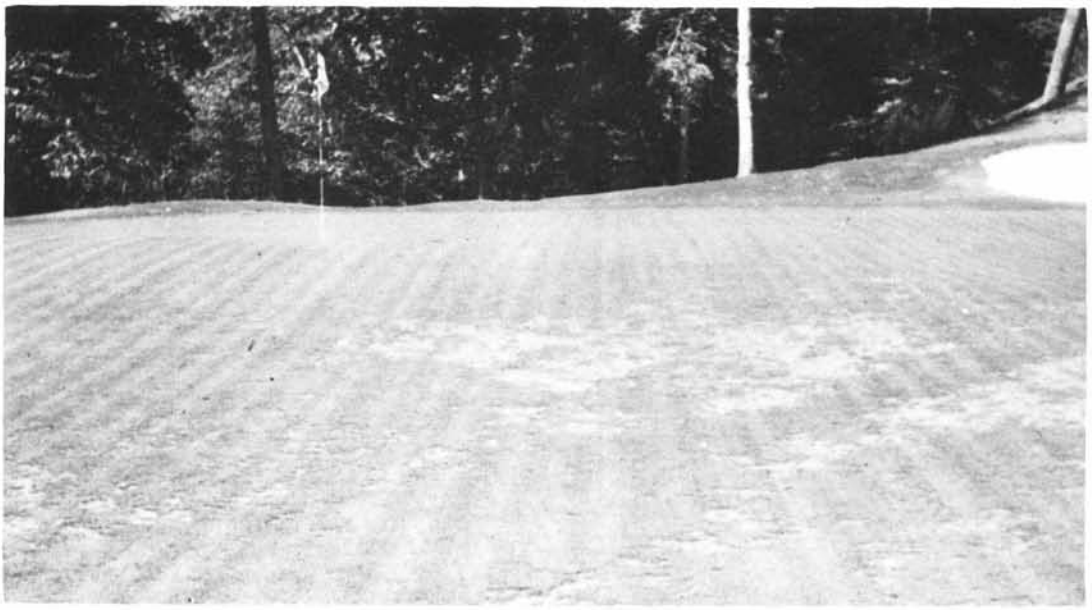
GRIFFIN: Let's start off by asking our panel members what kind of turf management year 1973 was. What might have been done to prevent serious turfgrass problems last summer and what we might look forward to in order to improve management in the future.

RADKO: For the Northeast, 1973 was a year of extremes. We had extreme humidities, extreme heat, excessive rainfall and that combination is pretty tough to overcome and to avoid turf problems. With heat alone, we can fare quite well through the season. When there is heat plus humidity, it takes a lot of good management to make it go. But when you have rain added to the other two, then you've got some real serious troubles. Our types of soils are unable to handle the heavy tropical-type rainfalls we had last summer. As a result, the heavy rains brought into sharper focus the drainage problems of past years. With standing water on our turf, there is no way to avoid trouble at higher temperatures. Therefore, the big problem this year was concerned with main drain lines. Many were not of adequate size to



Pythium strikes again. One of the most difficult of all diseases to control, pythium is now found throughout the United States.

handle the tropical-type rains we experienced.

GRIFFIN: Adequate drainage is then the problem that was high-lighted in the Northeast this summer. What were some of the problems in the West last year?

BENGEYFIELD: Our greatest problem, 12 months year in and year out, is that of golfer traffic. We have courses that will average over 300 rounds per day every day of the year!

During the past year, we also found a greater interest from Green Committee Chairmen during our visits, and if you want to gain someone's attention, start talking about money. Because labor costs are continuing to soar, a good deal of time was spent last year in reviewing and discussing the use of labor-saving equipment. With labor costs still accounting for up to 70 per cent of the total budget, any device that will reduce labor requirements deserves consideration and study today. Unfortunately, many clubs are not taking advantage of new equipment developed by the manufacturers. We tried to highlight these equipment developments:

1) Labor saving attachments for three- or four-wheel scooters are now available, including fertilizer spreaders, spray tank, and boom and top-dressing spreaders. With the fertilizer spreader, for example, one man can fertilize 18 greens in less than one hour's time. With the spray rig attachment, one man can cover 18 greens in less than three hour's time whether it be fungicides, insecticides, herbicides, iron or liquid fertilizer. With the top-dressing attachment, top-dressing is again practical.

2) There is also increasing interest in going from seven-gang fairway mowers to nine-, 11- and even 13-gang fairway units. Labor efficiency soars. There seems to be renewed interest in pull-type fairway units rather than the hydraulic machines. And more superintendents are showing interest in the direct-drive mechanism to the reel rather than the wheel-gear-driven linkage.

3) The use of triplex putting green mowers for tee maintenance is definitely on the increase. It is a tremendous labor saver. The use of mechanical bunker rakes has been very well accepted, and many clubs are even changing the style and contouring of their bunkers to accommodate this piece of equipment.

4) The use of chemicals is on the increase for control of grass growth at tree bases. With labor costs up, it is difficult to justify the hand trimming of all tree bases every week or so.

5) Look for wider use of dyes and paints on bermudagrass fairways where ryegrass overseeding has been the practice in the past. With ryegrass seed prices skyrocketing, the dyeing technique is receiving considerable attention. There is a tremendous saving in costs and the playing quality of the golf course is not damaged in any way. From an appearance point of view, the dyes or chemical paints are not bad.

GRIFFIN: Well, two points have been made; that of traffic on the golf course and drainage. Monty Moncrief and Lee Record, what are your comments regarding the past growing year.

RECORD: In the mid-continent area, many

of our members want to play golf early in the season, before good growth is underway. When you have heavy play and bentgrasses are not responding because of cold, wet weather, you are going to have problems. Low temperature records were set in the Chicago area last May. We had similar growing problems from Cleveland through Detroit, Minneapolis, and into Iowa last year.

I think we are sometimes too color conscious in our turf management efforts. We try to have things too green too early. Good turf can still play well without being deep green, and it would probably be able to withstand traffic better. On courses where an effort was made for early spring greenup, they seemed to have more mid-summer problems.

Turfgrass diseases were a serious factor. In many of our areas, we could not control *Helminthosporium* on greens or other turfgrass areas.

GRIFFIN: So you would say that drainage, disease and traffic were all problems in mid-continent. What happened in the South last year?

MONCRIEF: Just name it and it happened to us! We experienced snows in the Mid-South where we have never seen snow before. Heavy rains up to 15 to 20 inches a day. A considerable increase in insect activity was most noticeable throughout the South and in the Caribbean Islands. The Southern pine beetle has moved in, and they're going to be worse than ever with a mild winter. Once a tree is infested, it is best to cut it down and haul it away as soon as possible.

GRIFFIN: I'm glad, Monty, that you mentioned the increased problem from insects. In the Mid-Atlantic area, they have really been on the increase during the past two years when mild winters have occurred. Insects have been out in force with Japanese beetles particularly active in the Washington, D.C., area. We are somewhat at a disadvantage in the Mid-Atlantic area because of the chemicals we are permitted to use.

MONCRIEF: We have had a record number of tornados in the South as well. At Athens Country Club, Georgia, we lost over 300 trees to tornados.

GRIFFIN: I don't suppose you would want to tell us what to do about tornados?

MONCRIEF: RUN.

GRIFFIN: Are the superintendents in your area having problems getting chemicals to fight insects, diseases or things of that sort?

MONCRIEF: So far we have not run into any great or serious shortages of insecticides or fungicides. It looks like fertilizers may be the chemical in shortest supply in 1974. This means the superintendent must become more concerned with his soil and soil types on the golf course property. Soil tests and their proper interpretation will be very important.

RADKO: The EPA is taking a harder look at chemicals of lasting residual. We are therefore being forced to use insect control chemicals with little residual effect. This is going to effect our budgets in the coming years. Chlordane at reduced rates can still be used, but the grubs are reportedly developing a resistance to it and this is going to be a problem in the future.

RECORD: Cutworms have been a serious problem for us. They can do a great deal of damage in a short period of time on a putting green. With the newer chemicals such as Diazinon and Sevin, we may find it necessary to increase the scheduling of applications in order to control these pests. Some have tried newer chemicals at recommended rates and reports have been received of a burn or slight singe to the turf. Superintendents are concerned by this. Insecticides must often be applied when temperatures are in the80-85degree range. We need more information and experience with the newer materials before we use them on a wide scale.

GRIFFIN: In Virginia we have had no problem in getting insect control chemicals as yet because the Virginia Turfgrass Council has gone to the State Legislature and had some influence in writing the regulations reasonably. Basically, the available chemicals have been doing a pretty good job for us.

BENGEYFIELD: With the acitivity of the EPA and possible scarcity of supplies and equipment, it seems the superintendent will have to anticipate his needs to a far greater degree than ever before. Instead of running down to a supply house for a case of chlordane or equipment parts on an "as needed" basis, greater planning and storage may be needed to insure turf management efficiency.

GRIFFIN: Do you see any differences between granular and liquid insecticide effectiveness?

RADKO: I think it depends on the type of insect you are going after. In the Northeast, the hyperoides weevil seems best controlled with granular applications.

Another point in grub and beetle control is the proper timing or planning of applications. If you wait too long to get into a good program or if you overextended the residual effectiveness of an insecticide, a sufficient number of grubs may develop. By mid-summer serious damage may occur. If you try to spray them out at that time, you may be wasting your time and money. You may discourage them a little but, you will not get the control you would through a good preventative program. My point is, if you're on a regular program, you can stay ahead of the grubs and not permit them to get

ahead of you.

MONCRIEF: We are getting much better results with nematicides injected into the root zone for nematode control. They have a residual effect of one to two years and give good control of nematodes on fairways, tees and greens.

GRIFFIN: In Virginia this year, I visited a course that had just treated fairways with diazinon and have never seen more grubs on the surface in my life. They were almost as thick as my thumb. They were dying by the thousands and it was not the place to be at the moment.

Dr. J. Callahan, at the University of Tennessee, has found granular chlordane to be unsatisfactory in control work on sod webworm. In fact, it kills some of the natural predators of sod webworm. He suggests using liquid chlordane rather than the granular form.

RECORD: When we fail to grub-proof fairways and rough areas for many years, grub populations increase. Many courses may now need a new grub-proofing program.

In the Chicago area, there are clubs reporting a nematode problem on greens and it is associated with a type of *Helminthosporium* we can't seem to control. Dr. Joe Vargas at Michigan State is working on the problem as well as pathologists in Illinois. Control with Dasanit at 3 lbs/1,000 square feet is suggested with two applications needed; one in the early spring and the other in early summer. This can do some damage to turf when cut at 3/16-inch to 1/4-inch as well as to your health. If used, it may be necessary to keep everyone off the golf course for two days.

GRIFFIN: There is a proposed Federal Law that will require you to stay out of any area treated with certain chemicals for one or more days depending on the chemical.

Regarding nematodes, we seem to hear more and more about them each year.

RECORD: Dr. Don White, at the University of Minnesota, did a detailed golf course study in that State and found nematode populations on most every course. I don't know if they were beneficial or detrimental types.

MONCRIEF: Nematodes are more a problem in our area along the Gulf Coast.

GRIFFIN: What about some of the other chemicals such as systemic fungicides? Are they being widely used?

RADKO: Yes, they are being used and to good advantage, but we must learn how best to use them. With any fungicide, its smart business not to use it exclusively, and this is particularly true with the systemics. They should be alternated with other types of fungicides for best results.

GRIFFIN: Dr. H.C. Couch, at VPI, recommends the use of no more than six ounces of any systemic fungicide in a year. He finds a slowdown in grass growth from their use. By going to heavier rates, we may be playing with a loaded gun, especially if a nitrogen fertilizer is used to speed up growth. This type of back and forth growth worries some of us. It's like walking a tight rope. The systemics have also been reported, by Rutgers University, as causing small, yellow circles on greens. They find this is caused by basidiomycetes. These might be cleared up by alternating another fungicide such as Daconil with the systemic material. Daconil is the only one I have heard about that checks the problem. Dr. J. Vargas, at Michigan State, also suggests using systemic and contact fungicides alternately.

RECORD: When something is new, we jump right on it. This has been the case with systemics. Many courses have gone to their use exclusively, but I think the best program is a well balanced one between contact and systemic fungicides.

We have a cool season rhizoctonia which seems to be cropping up more and more. In Minnesota and Colorado, we have found cool season pythium activity. New pathogens seems to be developing with greater frequency. But with common sense, good cultural management practices and the wise, judicious use of chemicals, we can probably bring most of these diseases under control.

GRIFFIN: We probably never will have any one broad spectrum fungicide that will work on everything.

MONCRIEF: Regarding strains of pythium, a three-year survey in Georgia and throughout the South has turned up 22 specific pythium species. We used to think there were only three or four. The researchers also found these things will move from a dormant stage to an active stage in 55 minutes when all conditions are right.

RADKO: We did have pythium activity in the Northeast as well this year. However, proper identification is important. Sometimes, a real severe dollar spot attack will be confused with pythium.

GRIFFIN: I don't think we can really identify a disease or even a strain or variety of grass with the naked eye. There are too many similarities.

Bill, can you tie in the activity of diseases with golf course construction and design?

BENGEYFIELD: The turf disease problem in the West is not nearly as intense as it is in other sections of the country. But without any doubt, good drainage is of the greatest importance in golf course design and construction. Good air drainage, especially across greens, is all too often overlooked or completely neglected by the architect.

Where nutrients are adequate, disease can be reduced. Here, an overlap of fertilizer resulted in sufficient nitrogen and dollarspot was eliminated (dark strip with knife).

RECORD: During the last several years, many clubs have become interested in fairway renovation and developing bentgrass as well as bluegrass fairways. It is an appealing idea. However, a new word has entered our vocabulary in turfgrass management; i.e., "inconvenience." The best time to carry out renovation is when it is most inconvenient to the golfer. Mid to late July is the time to begin. The project should be started early enough in order to accomplish the job properly. By waiting too late in August, labor problems, weather problems and other difficulties hinder the job.

MONCRIEF: Pre-treated seed for overseeding greens has done a great job. It is money well invested. The greens get off to a good start and the need for reseeding is greatly reduced. Different fungicides are being used in combination formulated by the different seed companies.

GRIFFIN: Weeds and weed control is our next subject. In my area, goosegrass, silver crab or hard crabgrass—they are all the same thing with different names—is the greatest weed problem I find. What is yours?

RADKO: Silver crabgrass is the toughest. But the past year brought out many more weeds than ever before due to the stress to the turf. The weed seeds were there waiting to grow anytime that weaknesses in the turf stand occur.

BENGEYFIELD: In addition to the usual weed problems, we have some unusual ones as well. Veronica for example, is a serious problem in the Northwest. We have *Paspalum distichum* increasing on courses in Northern California. In Southern California, some exotic weeds exist and kikuyugrass is the best example. It's a tough one and each year seems to gain more territory. Control is extremely difficult and actually achieved only through methyl bromide and soil sterilization. It forms a poor golfing turf because of its heavy, coarse and thatchy nature. It can spread by seed, stolons or rhizomes, and in spite of some considerable research, it seems to survive all attempts at chemical control.

We also have sand dropseed, a bunchy, weedy-type grass that survives in areas where there is low fertility and low irrigation levels. It can be controlled with the arsenate materials if one perseveres.

Spurge or milky purslane is another weed we come upon quite often.

RADKO: On spotted spurge in greens, the phenyl mercuries have done well for us, but the applications must be very carefully applied. One ounce of PMA plus no more than 1/5-ounce of 2,4-D per 1,000 square feet will

work. But it must be stressed, the work must be very carefully done and at the proper time. Otherwise, bentgrass injury may result.

RECORD: *Poa annua* is our biggest weed problem.

MONCRIEF: The best control for weeds is good grass. Good cultural practices will do much in a weed control effort. Our biggest problem is with silver crabgrass, *Poa annua* and regular crabgrass.

GRIFFIN: We have a wide divergence of opinion on the Green Section Staff regarding the use of tricalcium arsenate in turfgrass management. These differences are undoubtedly due to the wide variation in climatic and soil conditions under which we have seen it used. Let's have some comments on this matter.

RECORD: Dr. Bill Daniel of Purdue University has encouraged the calcium arsenate program. We have learned from his experiences. Throughout the mid-continent, many golf courses are on a tricalcium arsenate program. I recall one particular club last year where tricalcium arsenate was applied to fairways in June because of the wet and cool spring season. When heat and moisture stress came along in July, out went all of the *Poa annua.* Since these were bluegrass fairways to begin with, there was little chance to reseed them with bluegrass in July and this became a serious dilemma. On another course where tricalcium arsenate had been used for years, they have gradually been able to change their fairways to bentgrass turf. However, last summer they wanted to find out what level of arsenical material was in their soils in order to properly plan for the future. When tests for the aresenical materials were made at Purdue, no more than one-fifth of the total arsenical applications could be accounted for. Where did the material go since it is supposed to be insoluble? It is a difficult subject and we do not have all of the answers. The success of a calcium arsenate program depends to a large part on the superintendent. How much does he want to gamble? The program does take a good man; a strong man and a very educated membership to make it go.

GRIFFIN: We have seen success with tricalcium arsenate. The secret seems to be to put it on with a teaspoon not a shovel. It can be a very useful tool in our area.

RADKO: Yes, it has been successful, but over the years we have found that you're going to have to take your chances with any preemergence herbicide. We have been impressed with the use of calcium arsenate on small test areas in the Northeast for several years. The rates used are far lower than those being applied in the mid-west. The reason calcium arsenate is a good tool is that in fairway renovation work, something must be used to suppress *Poa annua.* As we know, Poa can come on very fast and can wipe out the entire renovation effort, and so we have seen good results with sensible applications of tricalcium arsenate.

BENGEYFIELD: We should first determine on what area of the golf course we are using tricalcium arsenate. If you are speaking mostly of fairways, tees and possibly certain approach areas—then I think it is a very effective and good material. But if you are talking about its use on bentgrass putting green turf and collar areas, the risk is far greater than a wise superintendent should be willing to take. For example, on a Western golf course last year, tricalcium arsenate was applied to 18 greens at the recommended rate in the fall of the year. By mid-winter, when this particular golf course receives its heaviest play, greens were not in good conditoin. The *Poa annua* was under stress and in some areas completely dead. The owner of the golf course was concerned and sought advice. One of the recommendations made was that he must "keep the faith." His reply was that he did not mind "keeping the faith" but first had to "keep the play." The point is, tricalcium arsenate on greens or anywhere can be very dangerous and embarrassing. In my judgement, the risk is not worth the possible gain. There are other ways of controlling *Poa annua* on greens.

RADKO: Well, in our area very few are using this material on greens. Its primary use is in fairway renovation work. There are so many variables involved with it that one must indeed be careful.

BENGEYFIELD: Yes, as more and more research is accomplished with the arsenical materials, we find soil and climatic influences so pronounced that the response is not always predictable or dependable. I think that's a point we should not overlook.

RECORD: In looking ahead to 1974, I'd like to suggest you can always add but you can't take away. This year will be the year to add light amounts of material from time to time to get us where we want to go.

GRIFFIN: We have touched upon many subjects and yet have many more we could go into. But our time has expired and I want to thank you all for your attention.

RADKO: Holman, before concluding, I would like to mention the importance of research and the efforts being made today by the O.J. Noer Foundation, the GCSAA Research and Scholarship Fund and the Green Section Turfgrass Research Fund. These agencies are working in cooperation with each other and through research, we will continue to make progress in turfgrass management.

GRIFFIN: Thank you, Al, and thank you gentlemen.