



top condition or b) accepting lower quality in the course's condition.

Whether the impending law will in fact drastically curtail pesticide use on golf courses is currently unknown. Called the Federal Environmental Pesticide Control Act, it will establish administrative procedures for the newly-created Environmental Protection Agency to regulate pesticides as "general use" or "restricted"—*i.e.*, to be applied only by a "certified pesticide applicator." Most experts seem relatively unconcerned about the impending law's effects. They believe that it will cause golf course superintendents only mild inconvenience, that there are alternative means or ready substitutes for any chemicals that might be banned. Dr. Paul Alexander, director of education for the Golf Course Superintendents Assn. of America, however, takes a starkly pessimistic view:

"This new Federal law could deal a severe setback to the quality of golf courses. It could set them back to the standards of the late 1920s and 1930s. United States golf courses could again be overrun with crab-

grass, dandelions, pigweed, ragweed, brown patch, dollar spot, Pythium, Japanese beetles and cinch bugs. Anthills could appear again on greens. What golfer today can remember seeing anthills?"

Enactment of the new Federal controls is practically certain. By a 3 to 1 margin, the House of Representatives has already enacted its version and the Senate is expected to follow sometime in early 1972.

Battling nature

To put the pesticide problem in perspective, let's take a broader look at the entire problem of golf course maintenance. As indicated earlier, the modern American golf course is a triumph of technology over nature. Bulldozers, graders and other earth-moving carve out the trees and shape the topography to the architect's plan. Hundreds of tons of sand are poured into trap excavations. Specially bred grass seed is planted or pregrown turfgrass is unrolled for the greens. Fine-bladed bentgrass flourishes in the damp, cool English summers; London's parks look like

practice putting greens. But keeping bentgrass alive in our torrid continental summers is a botanical feat comparable to such medical marvels as iron lungs and mechanical hearts.

Maintaining a well-conditioned American golf course is thus a perennial war against nature. Left to itself, nature creates an ecosystem brimming with diversity. A tropical jungle, with its abundant, interdependent species of plant and animal life, is ecologically stable. Cornfields, grass lawns, rose gardens and other "monocultures" are highly unstable. Growing and maintaining a putting green is the world's most difficult and exacting horticultural task, according to Dr. Alexander. The ecological stability of a putting green is comparable to a bowling ball balanced on a cuestick.

Pesticides, which include fungicides, herbicides and insecticides, are of course only one aspect of scientific golf course management. Underground watering systems keep fairways green and sparkling throughout the golf season. Proper watering is critical. Too little water,

continued

too infrequently applied, allows the grass to burn and wilt. Too much water, frequently applied, produces shallow roots and tender leaves susceptible to fungus disease. In torrid climates, water can even act as a coolant, applied as often as three times a day. Water cooling can temporarily reduce soil surface temperature by as much as 40 degrees Fahrenheit. It prevents bentgrass from wilting and suffering permanent damage during prolonged hot weather.

Greenskeeping machinery has kept pace with the new course maintenance technology. Ten-bladed fairway gang mowers, replacing the conventional six-bladed mowers, enable a superintendent to eliminate the slight rippling that results from wider blade spacing. Mechanical spikers puncture and loosen compacted soil, allowing better root penetration and better aeration. Power thatchers remove the dense accumulations of old grass blades and new clippings that retain water and obstruct the passage of water and oxygen into the soil. Other equipment includes sprayers, sod-cutters and powered putting greens rollers-mowers, capable of producing carpet smoothness.

Also included in the golf course superintendent's arsenal are potent new nitrogen-releasing fertilizers and hybrid grasses—weed resisting U-3 bermudagrass for hot climates and fungus-resistant Penncross bentgrass for cooler climates.

Despite the great progress in all other phases of the golf superintendents' arts, pesticides are currently crucial in preserving the precarious quality of the nation's golf courses. About 10 per cent of a typical golf club's \$90,000 annual maintenance expense goes for pesticide materials and application. The most serious pests attacking golf courses are fungus diseases. Greens are especially vulnerable to fungus diseases, because they must be continually watered to promote growth and keep the low-cut grass alive.

Insects form a second major category of pests attacking turfgrass. Soil infesting insects—mole crickets, billbugs and grubs (beetle larvae)—attack roots. Others—cinch bugs, cutworms, scale insects, sod webworms—feed on leaves or stems. Ants

do their own unique thing, boring holes and piling the excavated soil on the greens.

Weeds also harrass the golf course superintendent: Crabgrass, dandelions, chickweed, clover and *Poa annua*.

The golf course superintendent fights these pests with an arsenal that includes some of the most potent chemicals used on farmland—notably mercury-based fungicides and the notorious insecticide, DDT.

The pesticide controversy

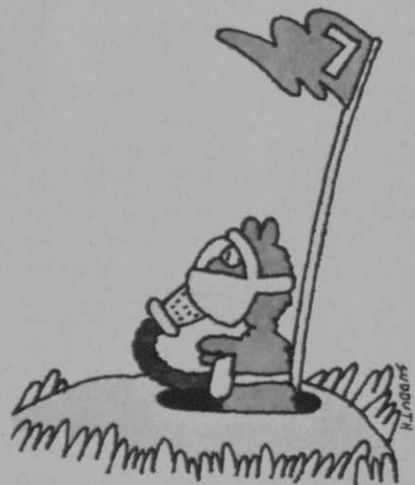
The direct threat posed by unrestricted use of pesticides is far less serious than the indirect threat. The conservationists' case against DDT, as an example, concerns its long-term effects rather than immediate hazards. As one of the major poisons developed during World War II by the pesticide industry, DDT has been sprayed extensively and in some instances with reckless stupidity. After the spraying of some one million tons of this durable poison over the past 25 years in the United States alone, DDT has invaded the entire food chain. Ocean algae contain several parts per billion; small algae-eating fish contain several parts per million and fish-eating seabirds contain many parts per million. Americans are storing DDT in their fat, in their livers and other organs. The effects of this storage are unknown, but ignorance is not to be confused with bliss. Even if current storage levels are harmless to human life, DDT, nonetheless, presents a potential threat. Its unrestricted use threatens largely unknown, but potentially hazardous changes in the ecological balance. Some insects have developed an immunity to DDT, but their natural control agents, predatory birds, have not. Uncontrolled growth of these DDT-immune insects could escalate the chemical warfare with even graver ecological consequences.

Against the conservationists' argument for banning pesticides like DDT, Dr. Alexander cites several counter arguments for permitting their continued use on golf courses. First there is the small scale of golf courses compared with farmland, the biggest pesticide consumer. More important, however, according to Dr. Alexander, is the nature of the land. Farmland readily leaches out pesticide

chemicals, which then run into streams and waterways. But the soil under good turfgrass is stabilized into a tightly bound system of interlocking turf roots. Mercury-based compounds are apparently retained for years, moving only a few inches, in the turfgrass soil. Golf course superintendents take great care in applying pesticides, especially in calibrating application equipment to guard against harmful overdoses. They seldom use aerial spraying, which often releases pesticides outside the target areas. In the past some large-scale DDT users have applied DDT as indiscriminately as saturation bombing. Golf course spraying is highly controlled—done either by superintendents skilled in the techniques or by an expert contractor called on for the purpose.

A recently-enacted New York State law offers a preview of problems that may soon confront golf course superintendents all over the United States if the Federal Environmental Protection Agency rigorously exercises its new powers to ban the more hazardous pesticides for general use. New York State's law bans several of the more potent pesticides—notably DDT and the mercury-based fungicides suspected of contaminating tuna and swordfish with mercury deposits after they leach out of the soil and ultimately flow to the oceans. Several New York State superintendents report no major problems resulting from New York State's law during the law's first golf season. Joseph Baidy, superintendent of Rochester's Oak Hill CC, site of the 1968 National Open, has successfully substituted the newest, general-purpose fungi-

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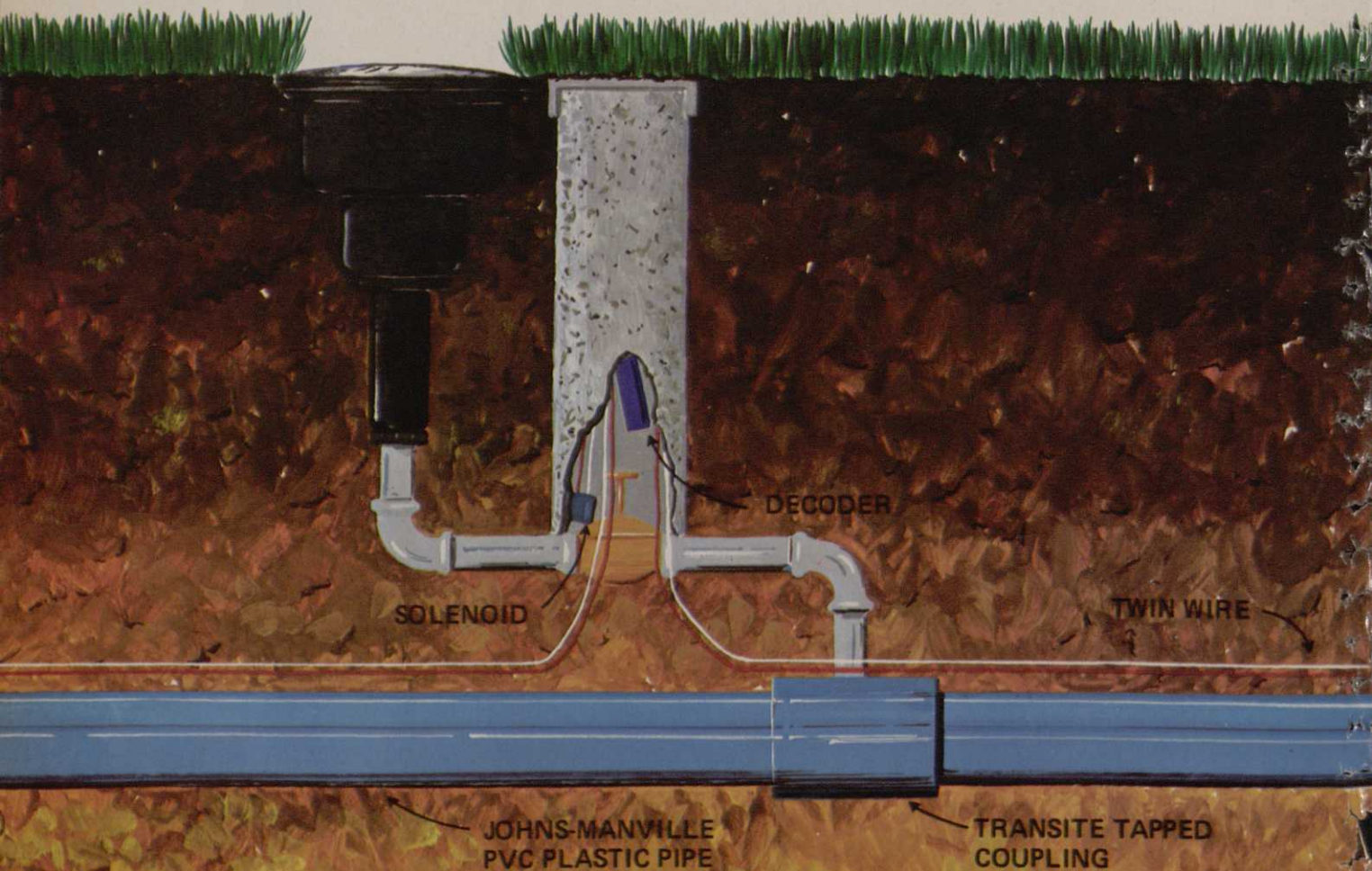
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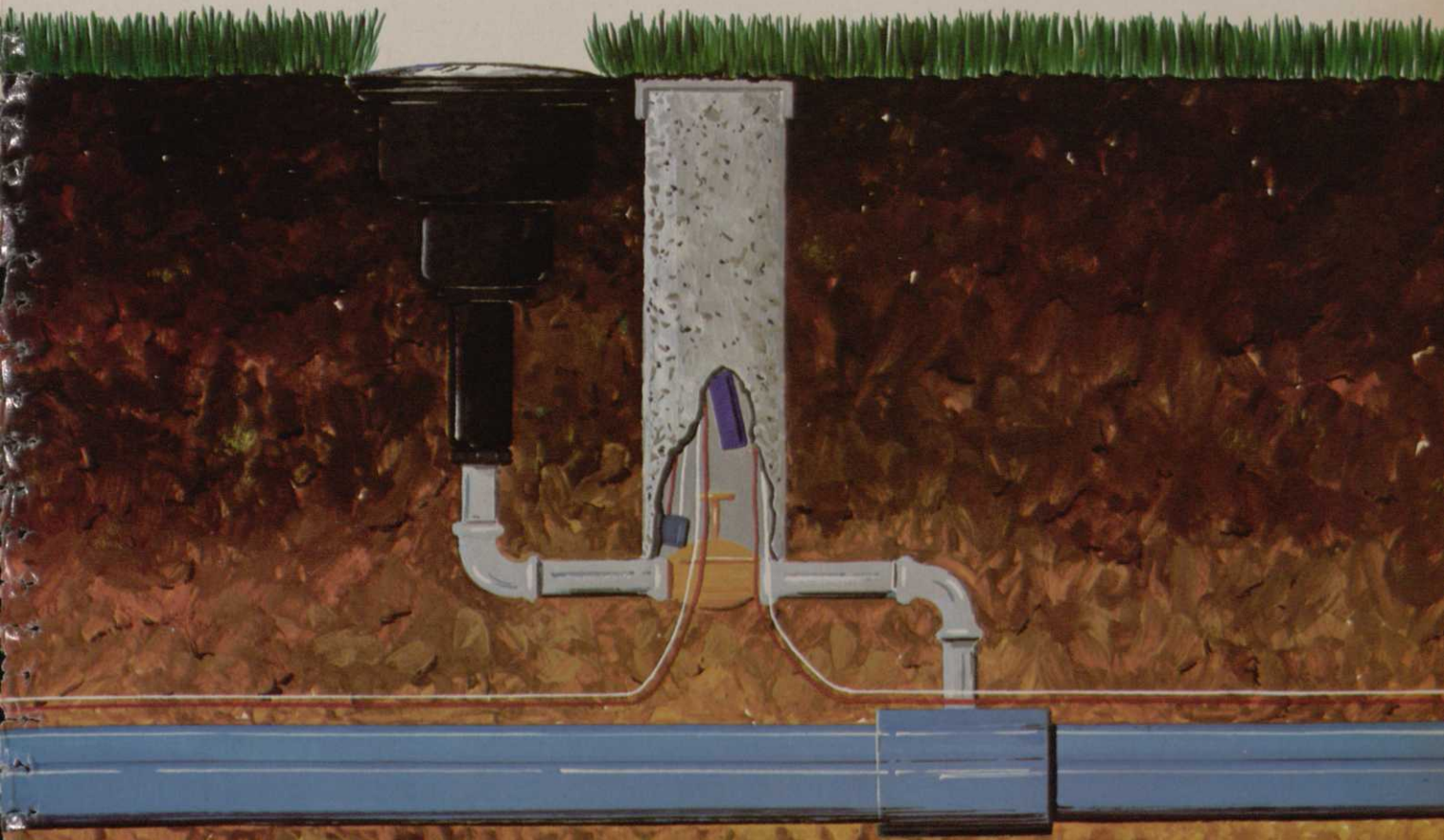
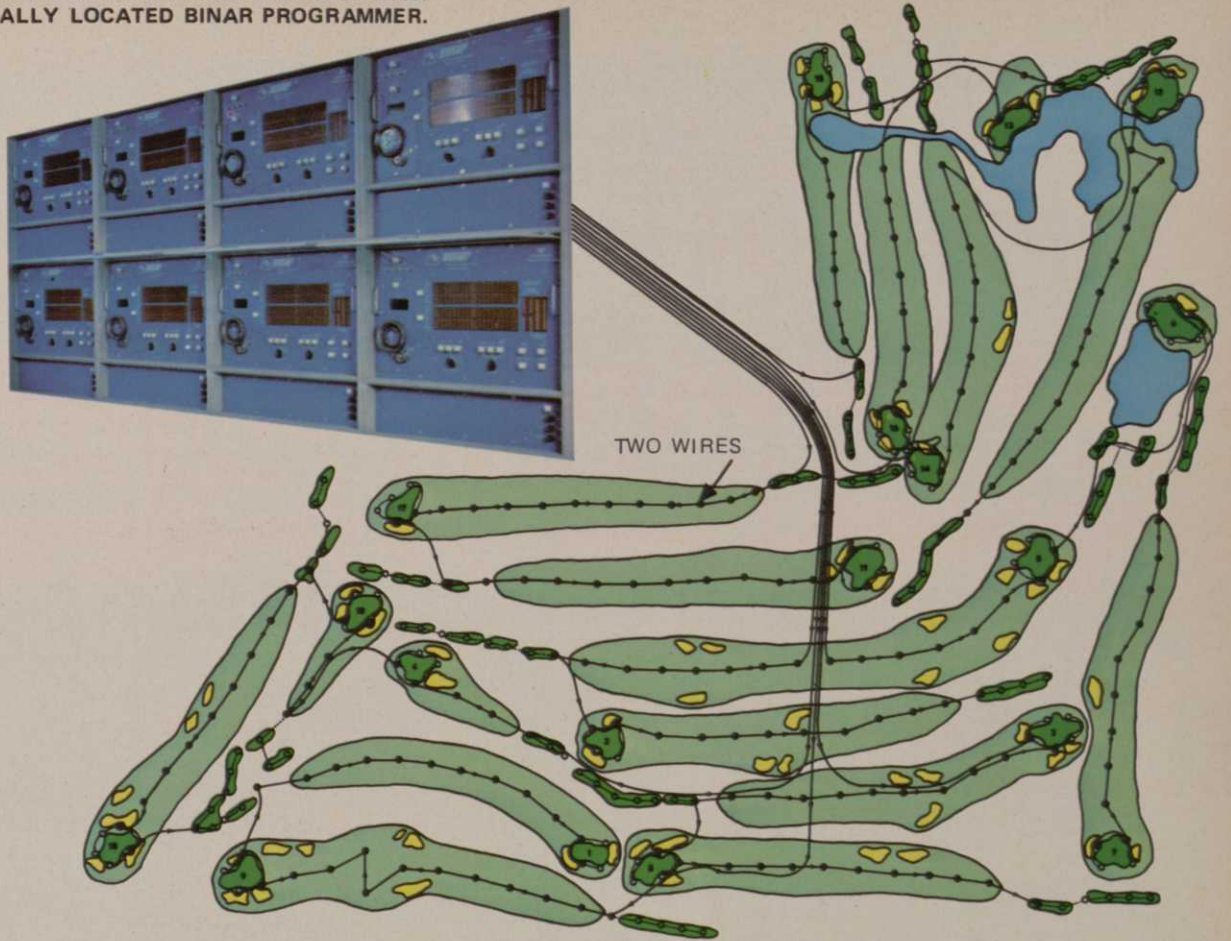
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CHEMICAL continued from page 52

cides for the prohibited mercury compounds. But Baidy says it's still too early to assess the ultimate effect of the state law.

The New York State superintendents may be insufficiently alarmed, according to Alexander. He foresees great difficulty in controlling snow mold without mercury-compounds, because, he claims, there are no proven substitutes available. Dr. Alexander also cites what he considers undesirable additional expense when substitutes are available. Substitution of less hazardous methoxychlor for DDT can raise the cost of controlling leaf-feeding insects by 90 to 180 per cent, according to Dr. Alexander. (It takes three annual applications of methoxychlor to equal one application of DDT.) Dr. Alexander predicts that within the next year or two the New York State law will exact a considerable toll, in reduced quality and higher maintenance costs, in the state's golf courses.

Rees Jones of Robert Trent Jones, Inc., golf architects, takes a more optimistic view of the golf course superintendents' prospects. Proper design can build in natural resistance to pests, according to Jones. He cites a new course near Houston, Sugar Creek CC, to prove the point. Opened for play in April, 1971, Sugar Creek required no fungicides throughout its first spring and summer. Though it

will inevitably grow more susceptible to fungus disease as it ages, the course will permanently benefit from its excellent construction. Jones attributes Sugar Creek's health to the drainage designed for the greens. With modern bulldozers and other earth-moving equipment, it is possible today to contour putting greens and fairways for good drainage. Sugar Creek's greens are not only contoured for good drainage; they also have a porous top layer mixture of peat moss, "sharp" sand and a four-inch layer of gravel—plus 500 lineal feet of drain tile per green. The fairways are crowned in the center to drain water toward the roughs, woods and ponds. By minimizing standing water, the golf architect simultaneously minimizes the chances of fungus diseases, because funguses thrive on excessive moisture. Such precautions for good putting-green drainage may add \$50,000 to total construction costs. But even before the course opens, the benefits start appearing—in lower pesticide bills plus other maintenance savings and in perennially healthier turf.

Even for existing golf courses that will continue to need pesticide applications, there is no rational cause for alarm. The most important counterargument is the Nixon Administration's lethargic record in all aspects of pollution control. It is inconceivable that an Administration so lenient

with industrial polluters that foul the nation's air and water would take drastic action against pesticide manufacturers. Unless the political winds shift about 180 degrees, the Nixon Administration will not drastically curtail pesticide use. It is difficult to imagine a Federal law tougher than the New York State law, and golf superintendents have managed to live with it.

In the long run, pesticide regulation, if not politically motivated, could have a beneficial effect on turfgrass management practices, says Al Radko, Eastern Director of the United States Golf Assn. Green Section.

"We've probably been relying too much on chemicals, not enough on mechanical methods," says Radko. "Chemicals should be a last resort, not a first resort."

The new technique of vertical mowing is one promising mechanical method cited by Radko. Low-lying crabgrass tentacles that escape the horizontal mower blades would not escape the vertical mower.

Used in conjunction with more thatching, aeration and better watering, vertical mowing can promote a generally healthier environment for putting greens, according to Radko. Reducing a thatch layer from one inch to one-half inch creates a firmer base that admits more water into the putting green's subsoil. The

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What the impending law means

The impending Federal Environmental Pesticide Control Act will ultimately require golf course superintendents to register as Certified Pesticide Applicators, unless they are content to use the pesticides available to homeowners. This certification must occur within four years of the bill's enactment, which is expected no later than spring, 1972. States can elect to license Certified Pesticide Applicators (CPAs). In states that don't exercise this prerogative, the Federal Environmental Protection Agency (EPA) will administer the licensing. Presumably, the EPA will require licensing applicants to pass an examination testing their knowledge and skill in applying pesticides whose improper use would endanger either the applicator or the environment. As Certified Pesticide Applicators, golf course superintendents may be required to keep records and file reports with state or Federal officials.

Under the expanded Federal authority provided in the new law, all commercially marketed pesticides will fall under EPA jurisdiction. When its new registration system goes in-

to effect, presumably within the next year or two, EPA will regulate each pesticide in one of four ways: 1) Ban its use totally, by rejecting its registration application; 2) Register it as a "restricted-use" pesticide, *i.e.*, a pesticide that may be applied only by a CPA; 3) Register it as a "general use" pesticide, *i.e.*, a pesticide approved for general public sale, or 4) Register it as both a restricted and a general-use pesticide, distinguishing its restricted from its general uses.

Expanded Federal regulation will naturally tend to make pesticide controls more uniform throughout the United States. The states will generally retain authority to impose stricter controls than the EPA's, but they cannot weaken any EPA controls.

Judged by EPA's current policy, DDT will probably be banned. Other pesticide candidates for a Federal ban are those containing lindane, mercury, arsenic, lead compounds, chlordane, endrin, heptachlor, toxaphene and several others. If any of the foregoing are not banned, they will probably be restricted.

One interesting feature of the act is the dis-

criminatory favoritism accorded farmers. Although they collectively pose a far greater ecological hazard than all other pesticide users combined, almost infinitely greater than the nation's golf course superintendents, farmers are favored in the proposed act's provisions:

- 1) Golf superintendents and other pesticide users are liable to a \$25,000 maximum fine for violating the act; farmers are limited to a \$1,000 fine;
- 2) Farmers are exempted from the record-keeping and report-filing that may be required of golf course superintendents and other CPAs;
- 3) Licensing standards must be "separate" (translate "easier") for farmers than for golf course superintendents and other CPAs.

One interesting sidelight: No one from the Golf Course Superintendents Assn. of America testified at the House Agriculture Committee's hearings, which were swarming with farm, industry and conservation lobbyists.

Questions about the bill's provisions should be addressed to: Pesticides Regulation Division, Environmental Protection Agency, Washington, D.C.

—C. W. Griffin

By Jerry A. Olson ASSOCIATE EDITOR

FIRST AID: WHAT'S PAR FOR THE

Tom takes a few practice swings on the first tee and conks Bill on the head; John slices a ball two fairways over hitting Alice in the face; Suzie dives into the swimming pool and hits her neck on the bottom; little Timmy gets into the superintendent's chemicals; a bee stings Betty; George, in his spikes, slips in the locker room.

Most of the above accidents could have been prevented, but unfortunately, one or all occur annually at most golf clubs. Are you and your staff prepared to handle these kinds of emergencies with the proper training and equipment? Although a club official may be a stickler for safety, in too many instances he is not prepared should emergency equipment actually be needed. It's rationalized that accidents happen at "other" clubs. So, the equipment on hand to deal with these unexpected accidents is usually a box of bandages or an inadequate first-aid kit.

It will probably cost the club anywhere from \$500 to \$900 to be adequately outfitted to handle emergencies which might arise around the golf course.

An accident on the golf course is the dread of every club. It may be a long time from when the alarm goes out until professional help arrives, but positive action by the manager, professional, superintendent and their staffs may spell the difference between life and death for an accident victim. The very definition of first aid is the *immediate* and *temporary* care given the victim of an accident or illness until the services of a doctor can take over.

This is not a "how to" first-aid guide. Rather, it is a fundamental listing of the type of equipment, and its uses, which are necessary for every golf club. Although most of the accidents that occur on a golf course are preventable, the club official can find little solace in knowing that it wasn't the club's fault the accident happened, if he wasn't prepared to handle the emergency.



The initial step in the area of first aid a club should employ is in communications. Most golf clubs, private and public, have a membership that includes at least one physician, fireman or policeman. A notice, followed by continual reminders, asking these people to register when they are at the club provides you with an expert in the knowledge of first-aid procedures. All the doctor, fireman or policeman has to do is inform the club when he arrives to play golf. The club notes the time he tees off. Then, should an emergency arise, he can be found quickly. This procedure is not practiced enough at golf courses. If the doctor does sign in, any calls that

come in are usually related to his private practice.

A procedure should also be established for calling emergency units. Telephone numbers of emergency units, ambulances, police and hospitals should be clearly posted on every phone. Delays looking for these numbers or dialing the operator can mean precious seconds are lost.

Communications at various points on the golf course should also be investigated. Many maintenance crews carry walkie-talkies connected to either the office switchboard or the superintendent's office. If your course has this type of communications system, make sure your staff

COURSE

Is your club adequately prepared to handle emergencies which can occur on the golf course, around the clubhouse or swimming pool? Quick thinking and basic first-aid equipment can avert tragedies



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and the members know about this capability for emergencies.

One of the most extensive (not expensive) communications systems exists at Dellwood CC in New City, N.Y. General manager John Straub got eight physician-members at the club to volunteer and carry club-owned walkie-talkies in their golf bags while they are playing golf. Superintendent Jerry Scafa and his crew also have communications equipment. In addition, there are three telephones located on trees at remote parts of the course. Installation cost of these phones was minimal, and now that they are connected to the club's telephone system; there

Basic first-aid equipment should include: 1. oxygen unit (\$80-\$100, large); 2. ambu resuscitation unit (\$200-\$225, hand unit, \$55-\$60); 3. stretcher or fracture board (\$30-\$50, minimal if handmade); 4. insect sting kit (\$5-\$5.50); 5. snake bite kit (\$2.95, optional); 6. first-aid kit (\$35, large; \$10 and up, small); 7. inflatable splint set (\$50 and up, complete; \$6-\$12 for each part, optional); 8. hot and cold packs (\$.75-\$1.50 each, optional). All prices are approximate.

are no phone company charges. Although every club hopes that these systems never have to be used for emergencies, Dellwood's has already begun paying dividends. "In one particular instance," Straub re-

calls, "one of our members suffered a heart attack while playing golf. A member of the foursome flagged the club's ranger. He in turn used his communication system to contact the club's switchboard. The switchboard contacted the police and ambulance and also called one of the physicians with a walkie-talkie who was playing golf. He was on a nearby fairway and rushed over and gave first aid. The maintenance vehicles, in addition to carrying communications systems, are equipped with first aid kits and oxygen. Less than two minutes elapsed from the time the member collapsed until a physician was at his side. Fortunately, this story had a happy ending, and the member is still playing golf today, thanks to the quick reaction of members and club officials."

When calling for emergency units, remember they will probably not be familiar with the layout of the club. Make sure someone is available to direct the emergency units to the spot. Time can be lost if they have to drive around trying to find assistance. If a club has emergency exits, or fences along its boundaries, they may be quicker and more accessible than driving to the clubhouse and then out onto the course.

And don't pooh-pooh any of those "strange but true" golf stories. According to Sergeant Brian O'Donnell of the Greenwich, Conn., Police Dept., any combination of accidents can occur on the golf course. O'Donnell, who has lectured to the Metropolitan Section of the Golf Course Superintendents Assn. on first aid for golf courses, has witnessed the impossible and inconceivable. "It is amazing the number of possibilities one can conjure up pertaining to accidents on the golf course," says the 11 1/2-year police veteran. "Falls, drownings in both swimming pools and irrigation ponds, bee stings, being hit by clubs or balls, heat prostration, heart attacks and strokes, golf car accidents, chemical burns

continued

FIRST AID *continued*

and ingestions, cuts and abrasions on the tennis court, snake bites, maintenance men cut by mowers, lightning, people breaking legs by falling over sprinkler heads, you can go on and on. While accidents and injuries are a pretty morbid subject," O'Donnell continues, "a club, nevertheless, must be prepared to handle any emergency.

"Every year we issue warnings about lightning," says O'Donnell, "and every year we have one or two people at a golf facility struck down. We had an incident last year," he relates, "where a person was struck by lightning as he was playing tennis. Fortunately, a passing patrol car saw the incident and was able to save the person's life. Some golfers want to play that 'one more round,' overexert themselves and have a stroke on the course. These accidents, taken into account with the number of people who are seriously injured by stray golf balls or shattered clubs, leads me to conclude that the golf course is a prime breeding ground for accidents," O'Donnell states. "Constant vigilance to safety must be maintained by all club officials and they must be prepared always for the unexpected."

Roderick A. Granzen, M.D., of the Scarsdale Medical Group and a member of Winged Foot GC, Mamaroneck, N.Y., can also testify to the eerie and unpredictable nature of accidents which can haunt a golf club. "Electrocution by lightning is not that rare on golf courses," says Dr. Granzen. "If a person is struck by lightning," Granzen says, "he is either 'dead' or severely burned. In some cases there is no evidence of injury but the sudden shock just stops all of the life giving functions. In one case," he recalls, "a person was struck by lightning, and because there were no visible signs of life he was presumed dead. When the emergency units arrived, he was given mouth-to-mouth resuscitation and closed chest cardiac massage and actually brought back to life."

Some of the basic equipment which clubs should carry, according to O'Donnell and Dr. Granzen, is just lying around the club and can be made useful by using a little ingenuity. A club can purchase a **stretcher**, but an important piece of equipment which can be fabricated and serve the

same function is a **fracture board**. The fracture board can be made of three-fourths- or one-inch plywood, 2 1/2 feet wide and approximately 6 1/2 feet long. Hand holds should be cut around the sides and straps can be added. This device can be used to transport persons with broken bones, neck or spinal injuries. Although it goes without saying that injured persons should not be moved unless absolutely necessary, some areas of the golf course are inaccessible, this means of transportation may be necessary. Also, swimming pool accidents, when a person dives into the pool and hits his head or neck on the bottom, are frequent. Damage is generally done to the neck or spinal region, and the person normally should not be moved. However, if he is in the water, he must be taken out. A fracture board at pool-side can be placed under the victim while he is still in the water. Because it is rigid, it assures that broken bones are not dislodged or moved. A pillow should also be attached to the fracture board.

A very basic item and therefore one normally overlooked are **blankets**. They not only provide additional padding for the fracture board, but more importantly, maintain the body temperature, not overheating, but preventing chills or shock from setting in.

Several good **first-aid kits** are also a prerequisite at every course. Not one with just bandages, aspirin and methiolate, but one with large-type battle dressings for packing a wound or gash. Tourniquets are generally included, but, and this is the case of all equipment and procedures, they must be used only by qualified and knowledgeable personnel.

Inflatable splints are also valuable and could prevent permanent physical damage should a person need to be moved before help arrives. They are simple to operate and fit over shoes or trousers. Again, this equipment should be handled by qualified personnel.

Medical oxygen and masks are extremely important when filling the first-aid arsenal. Strokes are an everyday possibility for golf clubs and especially for clubs with older memberships. Several oxygen units should be located at strategic locations around the golf course and clubhouse.

For the swimming pool and stroke victims an **ambu resuscitation unit**, a special breathing bag with mouthpiece is literally a life-saver. However, until this equipment arrives, rescue breathing in the form of mouth-to-mouth resuscitation must be administered. Both Dr. Granzen and O'Donnell point out the differences between an oxygen unit and the resuscitation unit. "Oxygen is great, if a person is breathing and air can reach his lungs," Granzen says, "however, it doesn't do any good if the air passage is blocked. For this reason, a resuscitation unit is vital, because it may get the victim breathing again." Oxygen can be connected to this unit. The resuscitation unit sells for about \$200. Both recommend the club have at least two, one at pool-side and one in the clubhouse.

Salt tablets are a must at every club. They should be located in the locker room and at some place on the back nine. Members should be encouraged to use them for replacing salt lost through perspiration and to help prevent heat prostration. Plenty of water should be drunk with the salt tablets to prevent nausea.

Insect sting kits provide equipment not available in regular first-aid kits. They are for extreme allergic reaction to insect stings. They contain adrenalin for acute reaction. (Adrenalin can be administered by non-physicians in an emergency. For legal questions refer to the Good Samaritan Law discussed later.) According to O'Donnell, emergency units treat insect sting reactions as a code one emergency, their highest, because they can be fatal in minutes. The reaction affects the nervous system and may cause suffocation and/or shock. There's no time to wait around for help to arrive in this instance. Just head for the nearest hospital.

Anti-venom snake bit kits should be purchased if poisonous snakes are common in your area. Such kits are best used only if early transportation to the hospital is unavailable. Again, action should be taken by a qualified person, but the club must have the equipment on hand for him to use.

Golf course chemicals can also cause accidents. Although it may happen to someone on the superintendent's staff, chemical ingestions and burns are more likely to occur to the curious child who wanders around

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