—meeting dates—

Turfgrass Equipment and Materials Educational Exposition, 12th annual, Southern California Turfgrass Council, Brookside Park, Pasadena, Calif., Oct. 11-12.

Southwest Turfgrass Conference, New Mexico State University, Las Cruces, N. Mex., Oct. 12-13.

Florida Nurserymen and Growers Association, 21st annual trade show, Daytona Plaza Hotel, Daytona Beach, Fla., Oct. 13-15.

Industrial Weed Control Conference, Memorial Student Center, Texas A&M University, College Station, Tex., Oct. 16-18.

Central Plains Turfgrass Conference, Kansas State University, Manhattan, Kan., Oct. 18-20.

Wisconsin Golf Turf Symposium, Pfister Hotel, Milwaukee, Wisc., Oct. 25-26.

National Institute on Park and Grounds Maintenance, 2nd annual, Muehlebach Hotel, Kansas City, Mo., Oct. 30-Nov. 2.

Missouri Lawn and Turf Conference, 13th annual, Ramada Inn, Columbia, Mo., Nov. 8-9.

Nebraska Weed Control Conference, 26th annual, Holiday Inn, Kearney, Neb., Nov. 8-10.

Washington State Weed Conference, Chinook Motel and Tower, Yakima Wash., Nov. 15-17.

Nebraska Turfgrass Conference, Kellogg Center, University of Nebraska, Lincoln, Nebr., Nov. 20-22.

Oklahoma Turfgrass Conference, student union, Oklahoma State University, Stillwater, Okla., Nov. 29-30.

Texas Turfgrass Conference, Memorial Student Center, College Station, Tex., Dec. 4-5.

National Agricultural Aviation Association Conference, 6th annual, Las Vegas Hilton (international) Hotel, Nev., Dec. 11-14.

Ohio Turfgrass Conference and Show, Franklin County Memorial Building, Columbus, Ohio, Dec. 12-14.

Western Association of Nurserymen, 83rd annual meeting and trade show, Plaza Inn, Kansas City, Mo., Jan. 7-9.

Golf Course Superintendents Association of America, 44th annual International Turfgrass Conference and Show, Boston, Mass., Jan. 7-12.

New York State Arborists Convention, Annual, Nevele Country Club, Ellenville, N.Y., Jan. 14-17.

California Weed Conference, 25th annual, Disneyland Hotel, Anaheim, Calif., Jan. 15-17.

Michigan Turfgrass Conference, 43rd annual, Kellogg Center, Michigan State University, E. Lansing, Mich., Jan. 16-17.

Southern Weed Science Society, 26th annual meeting, Jung Hotel, New Orleans, La., Jan. 16-18.

Rocky Mountain Regional Turfgrass Conference, 19th annual, Colorado State University, Fort Collins, Colorado, Jan. 25-26.

Virginia Turfgrass Conference, Sheraton Motor Lodge, Fredericksburg, Va., Jan. 30-31.

ISTC REPORT *(from page 19)*

chipper models on the market would not meet OSHA requirement. Efforts to develop kits to reduce noise levels of existing models have not as yet been successful; new models not as yet on the market, however, hold promise of meeting OSHA standards, he pointed out.

Dr. Paul Cheo, chief of research at the State and Country Arboretum, Los Angeles, discussed oak root rot disease *(Armillaria mellea)* and its control. He listed it as one of the most widespread diseases of woody plants in Southern California. It is able, he said, to parasitize almost 700 species of woody plants and some herbaceous plants, and is also a saprophyte, meaning it can flourish in the soil for many years on infected stumps, roots and other organic matter.

Dr. Cheo emphasized practical control. He pointed to soil fumigation as effective for a large scale operation, but as expensive and not recommended for home-garden, street plantings, or already infected trees. A valuable tree can be saved, he said, if its crown and anchor root trunk area can be protected from further damage. With good fertilization programs to keep up the vigor of the tree, an infected tree can live to its normal age. Exposing the crown and main root trunk area in the immediate circumference of a yard to the air-dried conditions, is highly recommended for oak and many other shade trees, he pointed out.

Deep watering, Dr. Cheo said, is recommended when watering is needed, and surface watering, especially the wetting of the crown and root trunk area should be avoided.

Effort has been made in the L. A. Arboretum, he said, to find chemicals which are effective in inhibiting the growth of *Armillaria* and which can be applied to exposed areas for further protection. Of 20, Dr. Cheo reported on three which have proved to be highly effective, showing strong inhibitory effects to the growth of *Armillaria* at or below the 50 ppm level.

These three effective chemicals, Dr. Cheo reported, are: (1) Actidione, an established fungicide, (2) Karmex diuron, an agriculture herbicide, and (3) 2,4 dichlorophenoxyacetonitrile, a closely related compound of 2-4,D.

Actidione, he said, is now being studied in the Arboretum laboratory for its practical application. It completely inhibited growth of *Armillaria* at the 25 ppm level in culture medium tests, he stated. When incorporated with 1% dimethyl sulfoxide (CMSO) as penetrant, Actidione at 900 ppm can be applied topically on the crown and exposed root trunk area. In oak trees where corky bark is thick, the reports debarking vertically for one-quarter inch in width near the crown area to promtoe penetration of Actidione to protect these areas. For smooth trees, such as lilac, Dr. Cheo said, constant wetting above the crown area with the chemical solution promotes the effectiveness of chemical action.

Further experiments are underway to find better means of application of Actidione to woody seedlings infected with *Armillaria* and also, he stated, to analyze whether active forms of Actidione can be transported to root zones.

Norman Gray, president of the Associated Landscape Contractors of America, Transit Seeding, Inc., Mansfield, Mass., discussed change in trade associations and criteria for their survival and effectiveness to their respective industries. Among the best moves made in his own

company, he said, was joining the ALCA. He reported he has since joined several other associations-oriented toward his business, and that membership is "the only way to go," for a businessman.

Associations, he said, have something to offer members, but their future is dependent on the results accomplished. Mortality rate is high, he said, when members are disinterested. He strongly urged member support in maintaining and building association projects. Gray stressed the need for a strong association voice which carries clout. "Associations," he said, "are listened to, but individuals, not very often.

"The big thing today is confrontation," he pointed out, stating that, "Your organization is the only one really capable of handling this for you." As an example, he said that the ALCA is working to create a strong national voice to speak for the landscape industry. "We must make ourselves heard, become involved at all levels of government, as well as all related building, financing, and designing industries."

Awards presented at the '72 convention included: Award of Merit — Harry J. Banker, West Orange, N. J., and John Z. Duling, Munice, Ind.; Authors Citation — George H. Hepting, Asheville, N.C., and Leslie Laking, Hamilton, Ontario, Canada; Honorary Memberships — Clayton M. Hoff, Wilmington, Del., Ethil M. Hugg, Johnstown, N.Y., L. R. Quinlan, Manhattan, Kan., and Lois Wilson, Toronto, Ontario, Canada; and Honorary Life Membership — Winston E. Parker, Moorestown, N.J., and Archibald Enoch Price, Glenview, Ill.

The upcoming '73 ISTC convention is scheduled for Boston, Mass., with Dan Warren, Jr., superintendent of parks, Brookline, Mass., as chairman of the local committee.

President-elect John A. Weidhaas, Jr., Virginia Polytechnic Institute, Blacksburg, Va., left, and outgoing President H. M. Van Wormer, Van Wormer Tree Service, Inc., Richmond, Va.

John D. Cyprien, assistant general chairman for the California Conference, (l) and Eugene B. Himelick, executive-director of ISTC.

Proper protective clothing is a big part of power saf safety. Note the newer type of screen-style protectors (on right).

Foolishly hanging saw temporarily on stubs or crotches not only could smash your saw, but also could kill or injure workers below.

POWER SAW SAFETY *(from page 30)*

on smoking while they are pouring gasoline into the saw! Even without cigarettes, refueling a hot saw always creates a certain fire danger. Volatile gas spilled on a red hot muffler could make an instant emergency for you. Refueling should be done in an isolated clearing and a funnel or fuel filler hose should be used to prevent gas spillage. Gas cap should be screwed on tightly and saw removed from the fueling area before restarting.

CLOTHES—Proper clothes should be worn by every chain saw user. This would include safety shoes (with steel toes), a hard hat, safety goggles or eye screens (to keep chips out of your eyes) and clothing that is not so loose that it could easily snag in brush (and cause a fall), or even possibly catch on the chain. If it is very cold you should wear gloves to make sure your hands don't get cold or numb enough to weaken your firm grip on the saw.

BUCKING AND LIMBING—These two operations actually make up the bulk of ground work with a power saw. In addition to the foregoing safety considerations, bucking and limbing operations require some additional care. Whenever cutting up logs it is important to prevent their accidental rolling over or dropping down, possibly on the saw man. This can be done by careful "chocking" to hold log firmly in place even after it is cut. The operator should still take care to always be uphill from any possible roll the log could take. When using wedges for bucking, special care should be taken to use only wood, plastic or other "soft" wedges. Accidentally cutting into a steel "wood splitting" wedge could throw out dangerous metal "flack" or cause your saw to kick back. (In addition to damaging and dulling your chains.) Use extreme care in cutting limbs that are above shoulder level. They could fall on you or pull the saw down suddenly, possibly into your body. Or they could swing around and hit you. Even tiny branches could severely injure your eyes. Or when limbs hit the ground, the butt end could "bounce back" at you. Many chain saw manufacturers show overhead limbing in their ads. But don't be fooled. It's very dangerous, even for pros.

Power Saw Safety Checklist

1. Don't start a saw till you have checked it over carefully. Spark plug wire on properly? Fuel cap on tight? Chain properly adjusted?
2. Think ahead. Know what you're going to cut before you start saw. Look around before you start.
3. Hold saw firmly at all times. When your hands get numb from fatigue or cold, stop till you're o.k.
4. Wear protective clothing. Especially protect your eyes and feet at all times.
5. Exercise care when refueling saw. No smoking! Move away from fueling area before restarting.
6. Keep work area clear at all times. Watch your step.
7. Don't carry a running saw around while it's running.
8. LOOK . . . LOOK . . . LOOK — Remember you have to compensate with your eyes for what you can't hear when cutting. Keep looking behind you and overhead. (Look down **often** if you're in a tree. You may get a signal from a groundman that could save your life.)

Remember there are no rules, tools, signs or designs that can prevent accidents. Only you can do that. Use all your equipment carefully . . . in good health!

SAFETY ALOFT

Nearly all professional tree men now use power saws while up in trees. They have been a great boon. But they do create an additional safety hazard (This topic was discussed at lenght in August issue's excellent article by Blair E. Caplinger.) The greatest of these dangers are:

CUTTING THE SAFETY LINE—This danger can be reduced by exercising extreme care to "sight up" your cut and make sure you know where your ropes are. Also, never pass a saw over or under any of your ropes when it is running. Not ever while idling. The slightest slip of the finger throttle could blow the last whistle for you. To be safe, any

saw operator in a tree should have **two** tie ins (one rope, one strap, etc.) when making power saw cuts.

MUFFLER BURNS — Not usually a cause for serious injury, but certainly worth avoiding. The few extra seconds it takes to let muffler cool are worth not getting burned for. Also, some saws are *designed* better than others in this department. Look for a better design on your next saw. Some climbers use a long saw holder strap to prevent getting burned. This is a bad move because then the saw can more easily get caught in branches and tangle in ropes. (Power saw teeth can cut rope even when not running.) Not only that, but the first thing you know the climber is hopping from limb to limb with the saw running, (yes, foremen, it's true)—a death-defying practice if there ever was one. A hundred minor muffler burns aren't worth one serious fall and if climbers are carrying their saws close on their belt you can bet they won't leave them running.

KICKBACK, KICKOUT AND PINCHING — Even on small cuts kickback can occur because of knotty wood, small branches in the way, etc. The man in the tree is usually cutting horizontally too, which makes it harder to hold the saw as firmly as if his feet were flat on the ground. The best bet is to try to get yourself in the best, most comfortable position possible and use the firmest grip you can. Also, check in advance for causes for kickback. Be on guard especially when cutting hard, dead wood. Try to use saw at arm's length, especially if cut to be made is derectly in front of your face.

The smart climber finishes *all* of his cuts with his hand saw. (Preferably with the power saw back on the ground or at least safely tied in out of the way.) This gives him an extra margin of safety in case the top kicks out before expected or a limb pops off ahead of time. He can swing clear much more safely with just a hand saw—which he can drop if necessary—than he could with a buzzing chain saw in one hand. In addition, the thinness of a hand saw allows you more cutting before "the pinch," and it's safer and easier to work it out if it does get pinched. Some of the most dangerous scenes I have ever seen in tree work have been climbers frantically trying to work a pinched power saw out of a cut before a big top or limb snapped off.

Some **Unexpected Hazards** that not many saw operators think much about until they happen are:

KICKBACK WHEN STARTING a cold saw . . . it can catch you off guard and cause a terrible cut.

ELECTRIC SHOCKS caused by faulty or loose ignition wires. This can cause you to lose your grip or drop a saw. Especially dangerous when you're up in a tree! Check to make sure spark plug wire is properly attached to avoid this shocking experience. Also watch for power wires whenever you're working in a tree.

CUTS FROM CHAIN while sharpening saw. Those teeth are viciously sharp even when they're standing still. Beware when filing cutters or drags and when pulling chain around bar by hand.

Am. Horticultural Society Receives $5000 Federal Grant

The American Horticultural Society has announced receipt of a grant of $5,000 from the U. S. Office of Education, Department of Health, Education and Welfare.

Society president David G. Leach said the grant would be used to enable the Society to host a conference that would look at the horticultural side of the environmental crisis. Anticipated date is fall 1973.

"The conference will call together key people active in horticulture, education, urban and highway planning, landscaping, communications, from national and civic organizations and other groups," Leach said. The invitees will be chosen because of their active involvement in environmental betterment activities, he added. Findings will be published and made available to the public.

Funding for the grant is made possible under the Environmental Education Act of 1970, administered by the U. S. Office of Environmental Education.

"It is our intention to apply the funds to develop better interrelation and coordination among environmental programs with a horticultural component," the Society's president affirmed.

"The AHS," Leach said, "expects a two-fold result from such a session: first, to help the non-horticulturists in an area where horticultural knowledge is of direct significance; second, to establish new priorities for horticulture by giving people in the field a more meaningful and relevant direction in the environmental area where the role of horticulture should be better understood and utilized."

HYDRILLA IN IOWA *(from page 14)*

mental products, identified it and sent it to Robert D. Blackburn at the USDA Research Center in Fort Lauderdale, Fla.

In late August, Blackburn, Patterson, other 3M Company officials as well as conservationists from Illinois and Iowa, a Wisconsin biologist and others gathered at the Riehle pond to witness the Hydrilla spectacle.

Blackburn quickly identified the plant as Hydrilla and told about 25 persons present, "It looks similar to elodea *canadensis* or American elodea. One of the identifying characteristics is the internode spacing. Spacing between internodes becomes less as the plant foliage approaches the water surface." Other characteristics of this weed are a flower and a tuber which develops under the soil. The density of tubers has been known to run between 35-125 tubers per square foot of soil.

Hydrilla is not native to the United States. It was imported several years ago as an aquarium plant. In documented cases, the weed has escaped and entered waterways and lakes in Florida where it has choked navigable waters. Hydrilla attaches itself to the bottom soil and sends out foliage in all directions.

The scientist noted that the Riehle pond water has a lot of calcium in it which is ideal for Hydrilla growth.

"I'm wondering if elodea *canadensis* is actually elodea," Blackburn speculated. "If you compare it to Hydrilla, the two look alike." What has been thought to be elodea may in fact be Hydrilla.

Presently there are three aquatic herbicides available that control Hydrilla. They are: System E herbicide from 3M Company, Hydout weed killer from Pennwalt and the tank-mix combination of Cutrine and Diquat from Applied Biochemists, Inc. and Chevron Chemical Company, respectively. All products are registered for use in Florida only.

Is there an immediate danger of Hydrilla invading other ponds, streams, waterways or even the nearby Mississippi River? Blackburn indicated that initially he was surprised to learn about the adaption of the weed to this colder climate. He said that Hydrilla has been cited in only three southeastern states.

The danger that exists depends on where it can be established, he said. Of course, one effective way to decrease the incidence of the weed is to isolate and quarantine known infestation areas. Hydrilla in the Riehle pond is the first case of Hydrilla outside of the southeast. Thus, isolating the pond from other ponds may prevent the spread of the weed.

Tests will conducted throughout the remainder of this year and a close monitoring system will be activated to hold any chance of a potential Hydrilla spread in check.

Peter Riehle, (standing) who first noticed the growth of the hydrilla in the pond, explains what happened. Environmental products experts from 3M Company, area newsmen, state and government officials and WEEDS TREES and TURF gathered at the pond for a quick breakfast before examining samples of hydrilla.

Proudly holding the Meritorious Achievement Citation received from Melvin R. Laird, Secretary of Defense, for the installation's outstanding conservation program, are Col. Arthur L. Knipp, Jr., Post Commander, Picatinny Arsenal and Frank Ferry, his deputy. Joining them are those who directly supervised work that brought award to Picatinny. Left to right, Michael George, grounds maintenance foreman; Joseph Bozzuffi, agronomist; and Alfred (Red) MacKinnon, chief, bldgs, roads & grounds branch.

Defense Conservation Award Won By Picatinny Arsenal

For the fourth time in the last five years, Picatinny Arsenal has won a Department of Defense conservation award.

With the Meritorious Achievement Citation, which was for the installation's 1970 conservation program and which complements similar awards for 1966, 1968 and 1969, came expressions of appreciation and congratulations from several highplaced officials, including Melvin R. Laird, Secretary of Defense.

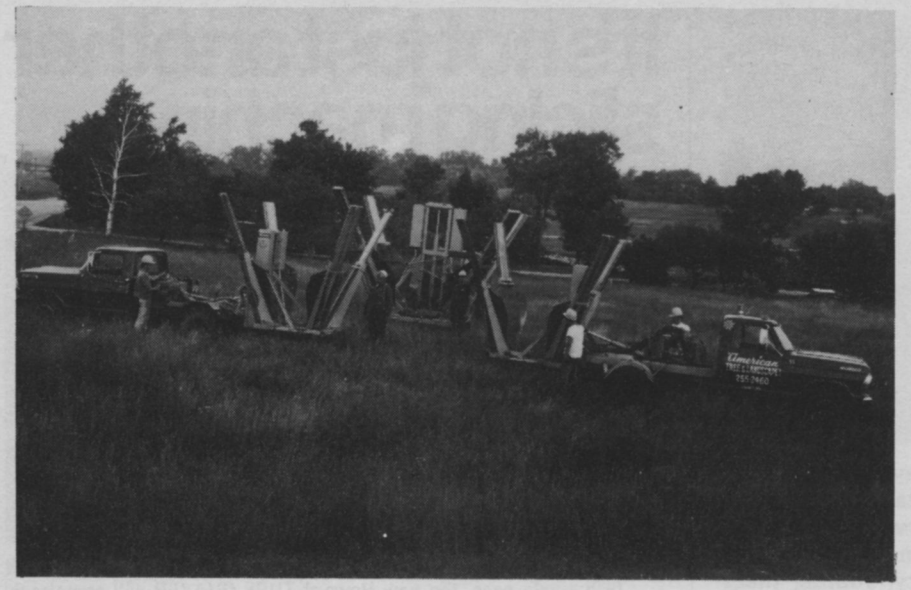
Mr. Laird noted that the Arsenal's outstanding conservation program "reflects great credit upon the installation, the personnel thereof, the Army and the Department of Defense."

Lt. Gen Joseph M. Heiser Jr., the Army's Deputy Chief of Staff for Logistics, said the citation attests to "the vigorous efforts made by the installation to promote fish and wildlife activity, create new recreational opportunity, and further the application of conservation and management principles."

Each year, Defense Department installations throughout the United States submit reports with accompanying photographs of their achievements in land, forest, wildlife and select the winners based on accomplishments in woodland improvement and protection, wildlife management, weed control, grass, tree and shrub planting, soil improvement, safety and insect control.

The arsenal maintains close liaison with county, state and federal agencies having related responsibilities in the field of natural resources conservation, including the Morris County Extension Service, the Mosquito Control and Soil Conservation District, the New Jersey State Departments of Environmental Protection and Agriculture and the U. S. Departments of Agriculture and Interior.

Picatinny Arsenal covers 6491 acres of land including 3793 acres of woodland, 1462 acres of improved grounds, 308 acres of lakes and ponds and the balance on other uses.



Digging the holes for the trees new locations.

Digging out the tree to be transplanted.

Setting trees into new locations.

INSTANT SHADE *(from page 16)*

and a developer earmarks these existing trees for destruction. Rather than simply churning out pulp from a transplantable tree, our staff now makes good use of these trees. We move them to *The Ranch*, a local home for mentally retarded children. Eventually, the picnic grounds at *The Ranch* will be dressed with mature trees to be enjoyed by the children and their friends.

Even here, our company's charity comes second to plain good sense of fully utilizing our services. Why destroy a perfectly healthy tree when it can be transplanted to bring pleasure and practical rewards to someone else? Today, it is within our reach.

I've been pointing out the "benefits" of mature tree transplants, so perhaps it is in order to list a few:

1. Erosion is checked.
2. Property values are increased.
3. The beauty of a site is greatly enhanced.
4. Noise pollution is reduced—sound is absorbed by trees and shrubs.
5. The general ecology is improved—trees are a natural habitat for birds, squirrels, etc.
6. Protection from natural elements is provided with a "living fence," for tennis courts, housing developments, industrial parks, etc.

If the benefits of the mature tree transplant are so great then one may rightly ask, "Why hasn't this practice spread in popularity, beyond the country clubs?"

To begin with, the practice of transplanting is becoming more widespread than ever before. **The major factor holding this practice back is mere oversight.** In most cases the architect, designer, developer, etc. does not stop to determine the cost or the client's desire for mature trees to be transplanted to a site. If the proper research is done, they would discover that the cost is not prohibitive, and the client is greatly appreciative of the creative suggestion. Just as in any landscape endeavor, there are numerous variables that influence the cost of transplanting trees. From our experience, once the transplant is considered it is very rarely thwarted by economic factors. **In fact, the cost of buying young saplings, planting them, and maintaining them is many times greater than the cost of transplanting mature trees already growing on the site.**

Nevertheless, what can discourage

(continued on page 44)

industry people on the move

TOM V. DECKELMAN, named branch manager, Allis-Chalmers Credit Corp., Columbus, Ohio. He will be responsible for sales financing and leasing of company products sold by dealers and distributors in central and southern Ohio and western West Virginia.

* * *

DR. RONALD W. TILLMAN, joined the staff of CPI Biological Research Center, formerly Crop Protection Institute, at Durham, N.H. He will be directly concerned with research and development of fungicides and coordinator of phytopathological research.

* * *

DAVID WHAN, named ProTurf technical representative in northern Indiana by O.M. Scott & Sons. He worked in turf research while obtaining his B.S. degree in agronomy and turf management at Purdue.

* * *

SIDNEY R. LUTTINEN, to district sales manager of the industrial chemicals department of Pennwalt Corporation. He will be responsible for sales activity in northern Washington, Alaska, Montana, northern Idaho and northern Wyoming.

* * *

R. C. (BUD) PRYOR, becomes quality assurance and technical services manager for Sabre Saw Chain Ltd. With 10 years of industry experience, Pryor will be responsible for quality and performance as well as customer service and liaison on a world-wide basis.

* * *

GEORGE B. VANDENBERG, transferred to Florida as southern district sales manager for Rohm and Haas in the agricultural and sanitary chemicals department. **JAMES L. PIERSON,** becomes manager eastern sales district from product manager for agricultural fungicides, miticides and fertilizers. **RON L. CHEVES,** assumes position of product manager, responsible for the sale of all agricultural pesticides.

* * *

JOHN C. NORTON, named general manager of consumer products as well as vice president in charge of the international and distributing divisions of the Toro Company. **E. H. WINGATE,** promoted to group vice president of administration with responsibilities for corporate planing and development, distributor relations, personnel administration, advertising and public relations.

* * *

WILLIAM E. CONWAY and G. G. PIRRONE, elected executive vice presidents of Diamond Shamrock Corporation. Conway was formerly vice president of the corporation and Pirrone was president of Diamond Shamrock Chemical Company unit. **WILLIAM H. BRICKER,** group vice president of Diamond Shamrock Chemical Company, has been appointed president.

* * *

J. NELSON FRENCH, joined Rental Equipment Manufacturing Co. as vice president of marketing. He will work closely with sales representatives and distributors across the country.

* * *

DAVID E. HERNDON, joined Thompson-Hayward Chemical Company as agricultural sales representative. He will be located in Sanford, Florida.

Safety Of Turf—Natural Or Synthetic

By JOHN H. HALL
Extension Turf Specialist
University of Maryland

The startling fact that consumer products each year injure 20 million Americans, permanently disable 110,000, and kill 30,000 more led to the hearings before the subcommittee on Commerce and Finance concerned with bills to protect consumers against unreasonable risk of injury from hazardous products.

The safety of synthetic turf was questioned during these hearings. The hearings have been completed and it seems a good time to summarize the subcommittee findings and discuss synthetic and natural turf.

The first artificial turf sports surface was installed in 1964 on a fieldhouse floor at Moses Brown Prep School in Providence, Rhode Island.

The first synthetic outdoor football surfaces were installed in 1967 on stadium fields at Indiana State University and Seattle Memorial High School. The popularity of the artificial surfaces increased rapidly to the point where 42% of all National Football League games were played on synthetic turf in 1971.

There are now more than 100 football fields in the United States constructed of synthetic turf.

Many cities and schools are considering the installation of synthetic turf.

There is disagreement over the usefulness and safety of synthetic turf.

The subcommittee attempted to shed some light on the question of the safety of synthetic turf.

Mr. Edward R. Garvey, executive director of the National Football League Players Association related the complaints of NFL players to the members of the subcommittee. He noted player complaints of sore knees and ankle joints, increased burns, excessive heat build-up, secondary injury from the bouncing effect, and increased danger of helmets grabbing on synthetic surfaces.

Dr. James G. Garrick, orthopedic surgeon and assistant professor at the University of Washington presented data from locally conducted research that involved 228 games played by 26 high school football teams and 1350 players. This data indicated that in the 1970 football season there were 0.76 injuries per game on synthetic turf and .52 injuries per game on grass.

Dry synthetic turf produced .93 injuries per game compared to .61 injuries per game on wet synthetic turf. Games played on dry grass turf produced .53 injuries per game compared to .50 injuries per game on wet grass.

College level studies by Dr. Garrick further support the contention that dry conditions on either synthetic or natural turf lead to increased injuries as a result of better traction and harder player-to-player contact.

Dr. Garrick never contended that his research had settled the question, but did indicate that further studies were needed.

A witness testifying in behalf of the synthetic turf industry later criticized the research work of Dr. Garrick, indicating his study method was superficial and his results inconclusive. Considerable data was presented by the synthetic turf industry in defense of the safety of their product. Their survey data generally contradicted the findings of Dr. Garrick.

It was generally agreed that a more extensive study was needed to determine whether synthetic turf is more or less hazardous than natural turf.

There are some important advantages to synthetic turf that must be honestly admitted. The increased wearability does mean that greater use can be made of intensive use areas. Maintenance costs after installation are less with synthetic turf.

Uniform cleaning bills are substantially reduced.

The advantages of natural turf include the fact that they are the most economical play surface available for all types of playing fields. An athletic field installation costs less than 10% of the cost of artificial turf.

Artificial turf cost estimates for a football field range from $350,000 to $400,000.

Natural grass is relatively easy and inexpensive to repair and provides the coolest playing surface available. On a 90° F day it is generally conceded that synthetic turf will be at least 20° F hotter than natural grass.

It appears the survival of synthetic turf for use on athletic fields hinges around four unanswered questions:

1. Is synthetic turf more or less hazardous than natural turf?
2. Does the safety of synthetic turf decrease with age?
3. How long will synthetic turf last before it must be replaced?
4. Can the installation cost of synthetic turf be reduced?

The investigations brought about by the Consumer Product Safety Act indicate that the answer to the first question will likely not be conclusively determined for 2 to 5 years. The answers to the second and third question must await time and further testing. The current cost of synthetic turf is beyond the reach of the average school athletic budget. Until the above questions are conclusively answered, the future of synthetic turf remains in limbo.

References

1. Part 1, Consumer Product Safety Act, serial no. 92-59 U.S. Government Printing Office, Washington, D.C. 1972. p298.