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Pat Fitzsimons tied the world record score of 58 on a 6,000 yard course and is now a touring professional.

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With 4 Installations In '74,

P.A.T. Takes to the Field

IN THE WORDS of Purdue lineman Ralph Perretta, "It's the best field I've ever played on." The field is in Purdue's Ross-Ade Stadium (this month's cover) and it now boasts a newly installed PAT system.

PAT stands for Prescription Athletic Turf, a system emphasizing a new concept in turf drainage, particularly for football and similar playing fields — suction. In just a few short years, this system has had the turfgrass industry buzzing. This season, several major athletic installations such as Purdue are putting PAT to the test.

"After 2½ inches of rain and with rain still falling, the field was still firm. It exceeded our expectations," said Alex Agase, head football coach at Purdue University, following a full scrimmage in August, 1974.

After a second scrimmage, a Lafayette Journal & Courier sportswriter summed up the field's performance in one line: "The PAT field was nearly perfect."

Just imagine a football game on normal soil with heavy rain falling as the team begins warmups. The coach loses his game plan as the players lose traction. Groundsmen stand by helplessly even though all possible pre-game work has been done. So a sloppy game results. But what a difference PAT makes!

What is PAT?

PAT is a system which permits man to manage the rootzone in turf. Even under the most adverse weather conditions, the system permits maximum field usage. If it rains, suction pumps tied to collector pipes and slitted drains draw the water through a sandy subsurface leaving the playing field firm. As the raindrops fall, both water and air are pulled downward away from cleats, clothes and players.

Besides the drainage feature, PAT offers several other advantages. A plastic sheet between subsoil and sand helps conserve rainwater, and an automatic subsurface irrigation system triggered by moisture sensors aids turf management and maintenance. Rootzone warming by heat cables or a vented field cover on power rollers helps counteract cold weather extremes. So the players have traction, safety and freedom from mud.

Features Aid Water Control

Suction, the heart of the PAT system, is the key to success — positive, downward, instant, rapid, uniform and efficient suction.

A sprinkle, a rain, any excess moisture at the surface causes a slippery sliding interface between soil particles and thus poor traction. If it sounds "squishy" underfoot, it's obviously too wet to play.

The uniqueness of the suction principle and its effective uniformity is accomplished by diffusion through a washed sand profile. Pulling the water and air from the surface means constantly releasing water downward into sand and drains and pumps. In every test and on every field it has worked well.

In comparison, many prior improvements in turf, such as sandy profiles and vertical trenching, have been inadequate because they still become slippery at the surface when wet. In contrast, stripping rain down by suction has proved adequate. In fact, tests at one installation site showed 24 inches infiltration per hour after one season of use.

But since sand tends to be drouthy, water conservation becomes critical. A barrier of tough plastic sheeting is installed to isolate the subsoil from the compacted sand above. Moisture is held at low tension in the sand and is readily available to the roots. Now the player gets uniformity in playing conditions day after day because the conservation of rainfall or irrigation is maximized.

During the summer, an open outflow — say four to six inches above the level of the barrier — serves to hold added water to the maximum. The system conserves nutrients in dilute solution and minimizes the need for irrigation. Fortunately, above the level barrier at low moisture tension, water constantly redistributes and adjusts toward uniformity, so roots have maximum soil water supply.

An automatic subirrigation system completes the task of water control. Throughout the growing season, whenever moisture is reduced to a preset availability, a valve is opened and water recharges through the collectors and the slitted drains. When the moisture sensor becomes wet again, it automatically shuts off the irrigation. The moisture recharge is adjustable in four different ways: 1) depth of sensors, 2) spacing of sensors, 3) signal point selected on the adjustable dial and 4) recharge rate. This phase is currently being developed and standardized.

In the early days of PAT, each field tended to be overwatered by manual watering procedures, so the installation of moisture sensing completes the best of management.

PAT, Inc.

The first operating PAT model was just 10 square feet in a greenhouse in January, 1971. The initial descriptive write-up was shared with 10 turf people. Then 100 turf people were contacted during the Golf

By W. H. DANIEL, M. L. ROBEY and ROBERT LINTON

This profile model of a PAT system shows the plastic barrier, collector pipes and slitted drains.

One inch of rain fell just prior to this football game at Grand Valley. There was no mud on the field and play continued.

Course Superintendents Association meeting in February, 1971.

The patent application, filed through Purdue Research Foundation in June, 1972, list Dr. W. H. Daniel, turf specialist in agronomy at Purdue, and Melvin J. Robey, now superintendent of Purdue's athletic facilities, as co-inventors.

Daniel has been at Purdue since 1950 and has been involved in three rebuildings of the turf in Purdue's stadium and in the development of the slitted pipe by Hancor, Inc. Robey was involved in the last rebuilding of the stadium and in modifying the practice fields.

The exact specifications for each field is exclusively the responsibility of Prescription Athletic Turf, Inc., of Lansing, Michigan, with Robert Linton as general manager. This company has a national license with Purdue Research Foundation to market the system. Further, by that agreement, their claim for the system must include all features as specified. Owners can therefore be assured of installation standards and performance as specified.

The First Fields

Goshen High School, Goshen, Ind., was the first. In this economy model, only one pump is used for a 110-foot by 310-foot area in the center of the field. It took two months to install and sod, then play began two months later. At the end of the second season at Goshen, a one-inch hose was run at full stream for 30 minutes (for test purposes) in the worst low-spot and most compacted area where the band and team concentrate. With pumping all signs of added wetness disappeared in 15 minutes.

That field was used 27 times in 1972 and the turf stayed in place. In 1973, usage was expanded to 47 activities, and in 1974, the field is again seeing lots of action. Suction pumping has been used about three times a year during the playing season.

The Grand Valley State College, a new college near Grand Rapids, Mich., had extremely hard practice fields, so chose a PAT system for their playing field. The sand used was a pit run as available locally, and the field was sodded with a blend of bluegrasses. With over one inch of rain falling during a game, the field was firm and free of ponded water.

The 1974 Fields

Melvin Robey directed the building of the 63,000 square-foot PAT field in the Ross-Ade Stadium at Purdue. Excavation was 16 inches below the prior sideline grade, thus 26 inches in the center of the field. Finished grade was the same as the old sideline with only about two inches of rise in the center. The sand used was a local washed pit sand, very diverse in size, with only 26 percent pore space when compacted. The pH was above 7.7 so extra phosphorus was incorporated to allow for expected fixation.

Excavation began late March, 1974, and sodding with Warren's A-20 cultivar of Kentucky bluegrass was completed in early June. By early September, the roots were nine inches deep.

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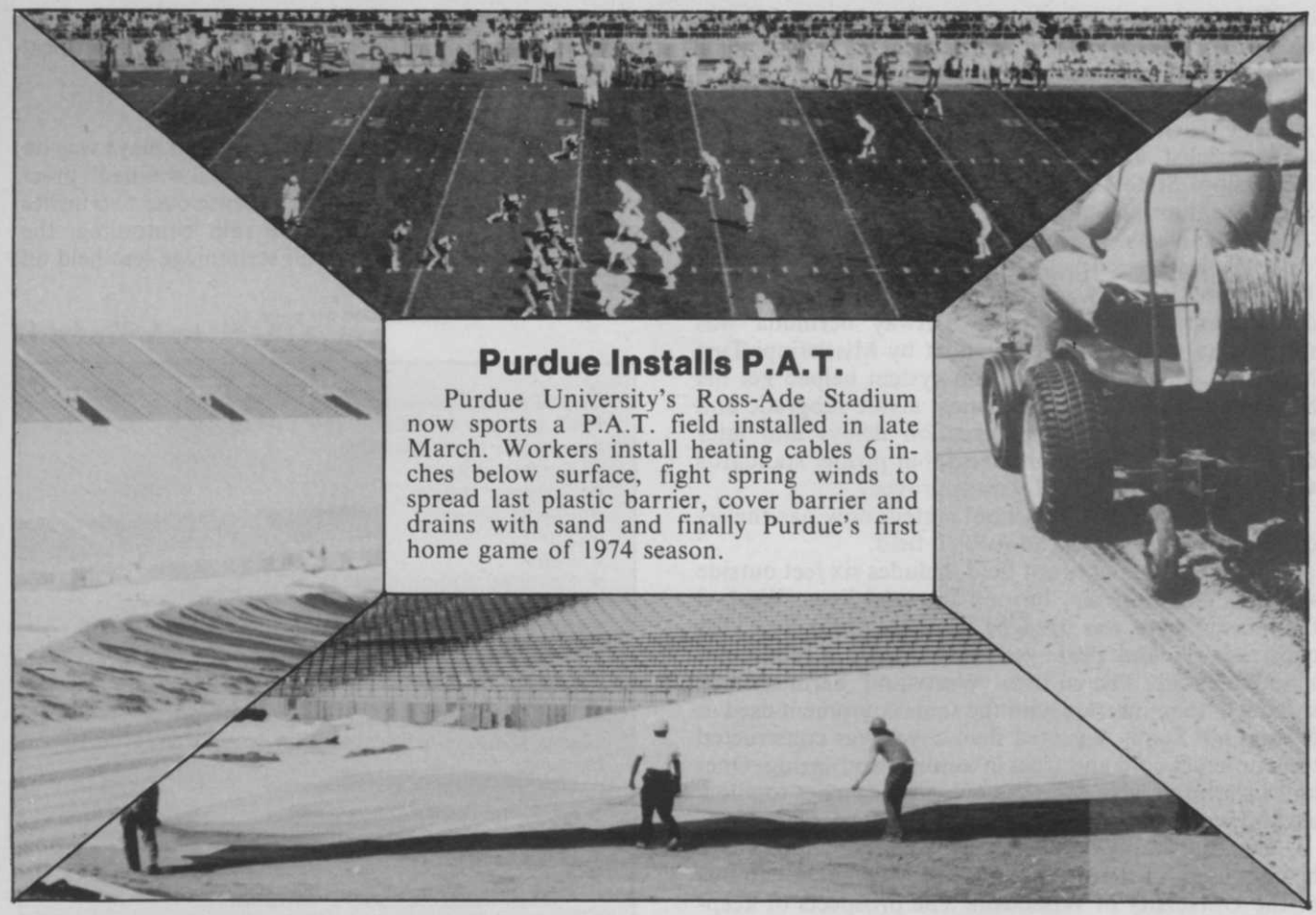

Purdue Installs P.A.T.

Purdue University's Ross-Ade Stadium now sports a P.A.T. field installed in late March. Workers install heating cables 6 inches below surface, fight spring winds to spread last plastic barrier, cover barrier and drains with sand and finally Purdue's first home game of 1974 season.

Since a three-row sprinkler system was already in the old field, it was reinstalled and has proved very useful in sod establishment and maintenance.

Bob Linton, general manager of Prescription Athletic Turf, Inc., working with Dr. Coleman Ward, turf specialist, and Al Scoggins, facilities supervisor for Mississippi State University, developed a PAT field in Scott Stadium at Starksville, Miss.

The field was excavated to leave the final grade level with the adjacent track. The sand, dredged from the Tombigbee River, was uniform and fine, so finished depth was 18 to 20 inches. Tiftway bermuda was sprigged in with special equipment by Mississippi Turf Nurseries. A portable irrigation system helped get the bermuda started. Torrential rains, a soft subgrade and saturated sand caused construction delays and later drain tube replacement problems, but proper standards were met before the field was approved.

The Evansville, Ind., school system now has the second completed high school PAT field.

The 53,000 square-foot field includes six feet outside sidelines and four feet beyond the goal lines. Washed fine mason sand was dredged from the Ohio River for construction, and peat was mixed in by a motorized sand trap rake. The cultivar 'Westwood' bermuda was shredded, then inserted with the same equipment used at Mississippi State. A vented field cover was constructed to counteract cold and frost in autumn and spring. One-half inch holes were punched every four inches to allow air and water exchange and to make a "sweater" effect.

The fourth PAT field of 1974 construction was a heavily-used intramural field on the Milwaukee campus of the University of Wisconsin. The prospects of keeping the soil thawed, with more use during open winter days and early spring, and less mud made the PAT system the preference of those at Milwaukee for the 72,000 square-foot area. The sand used was a Lake Michigan dune sand of the finest texture available. After peat was incorporated, A-20 bluegrass was sodded.

Performance

Purdue's first squad scrimmage of 150 plays was on Sept. 4, 1974. Actually, the nearby "well-drained" practice field was too muddy for use because over two inches of rain had fallen. So with the rain continuing, the pumps were started and the full scrimmage was held on the new PAT field.

(continued on page 46)

Based on turf research and observation, a complete PAT system envisions the use of 12 elements for maximum management:

- Suction pumps
- Collector drains
- Plastic sheeting
- Sand
- Peat
- Calcined aggregates
- Slow release fertilizers
- Automatic moisture sensing
- Soil heating cables
- Vented plastic covers
- Power rollers
- Vigorous disease-resistant grasses

These 12 items in combination provide the following features:

- Uniform surface suction
- Level fields so water moves down
- Water conservation (outflow control)
- Nutrient conservation (above the plastic)
- Automatic subsurface watering
- Porous rootzone (ample air at roots)
- Heat addition (keep soil thawed)
- Heat conservation (reduces frost action)
- Wear resistance (increase growth)

Excess water is placed on a PAT field by a one inch hose.

All water is pulled away by pumps and gravity within 10 minutes.

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In fact they start slowing down as bacterial activity slackens—when the temperature falls below 80°F. Winter starts for them long before the leaves fall.

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I.P.A.A. Meeting Report

Pesticides, Politics and Professionalism

PROFESSIONALS. A title applied to members of the traditional professions: medicine, law and the ministry. They are involved in a code of ethics, a way of life and a constant, positive input for their profession and its institutions. Literally, they qualify as professionals because they are members of a profession.

But what about the industries of the Green Industry? Do they qualify on the same level as the traditional professions?

The International Pesticide Applicators Association (IPAA) is one Green Industry organization trying to reach those lofty standards. At their annual meeting September 18-21, in Seattle, Washington, discussions centered on professionalism, political strength and educational improvement.

Host for this year's program was the Washington Chapter of IPAA. Wednesday the host sponsored a tour of local businesses including Washington Spray Service, Eastside Spraying Service and a few local landmarks.

Persons attending the tour were treated to firsthand examinations of some custom equipment. Don Mock, past president of IPAA, demonstrated original design equipment at Washington's main office. Mock described the workings of a manually-operated lawn pesticide applicator. It combined a speed-of-travel indicator, controlled tip spacing and size and a pressure gauge — all the components necessary for accurate chemical application. John Beheyet, owner of Eastside, also demonstrated his unique proportioning spray rig.

Keynote speaker for the meeting was Erret Deck, assistant director, Alaska Department of Agriculture. He discussed current label and product certification regulations and how they would affect the pesticide applicator. After a short history of government controls and legislation applying to pesticide application, Deck pointed out that uses inconsistent with the label would have to be more hazardous than those listed on the label or uses in or around the home as long as the rate and timing followed the label. Retention of state flexibility in certification programs was also a major point in his presentation. A total program for licensing dealers, applicators and consultants should be left in control of the states, he said. Deck's presentation was followed by a lengthy question and answer period.

Dean Jamieson, vector control specialist, Santa Clara City Health Department, discussed pathogens, predators and parasites. Jamieson presented statistics on worldwide biological insect control. He said there have been 20 cases of complete or substantial control in the United States, with three of those resulting in complete control.

Improving and maintaining employee relations was the topic of after-lunch speaker, Lyman Gies. "Once you've defined the problem you have it half solved," he said. And in order to solve most human relation problems, he suggested that you first identify the problem, analyze it, generalize and then take a projected course of action.

Insect life cycles was the topic of Lee Campbell's talk on Thursday afternoon. "Know the life history of the insect you want to spray; the egg hatch, flight period and the larval stage," he said. Campbell suggested that the time to spray is not exactly when the damage is being done. Determine when the most vulnerable period in the life cycle of the insect is and then spray accordingly, he said. He talked of selling spray schedules to customers and said don't sell spray, sell service.

C. Howard Rice, Dean Witter Co., discussed investments and tax shelters. He reviewed the pros and cons of common stocks, preferred stocks and bonds. Rice emphasized municipal bonds, saying "there has never been a failure to pay a municipal bond in the state of Washington."

Friday's education program started with an interesting and entertaining in-basket exercise. Rod Fairbanks, Fairbanks Spray Service, distributed lists of typical complaints, problems and compliments possibly experienced by an business manager. Conference

(continued on page 31)

John Beheyt, owner of Eastside Spray Service, Kirkland, Wash., demonstrates his pressure-compensated, proportional-mixing spray rig.

Chuck and Carol Seibold, (left), Major Spray Service, Portland, Ore. Chuck is program chairman for the 1975 International Convention. I.P.A.A.'s new president, Gary Mulkey, Mulkey's Spray Service, Eugene, Ore., is also president of the Oregon Chapter.