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## O. J. Noer's Turf Roundup

(Continued from page 51)

inches of snow, accompanied by sleet, fell in late Mar. Weather turned unseasonably warm the week after with temperatures up to 90 degs. Then came several heavy rains followed by cold or cool weather which persisted into June. This delayed recovery. Growth was started by the warm weather and was stopped by the cold snap with a high grass mortality. Poa annua got hit worst but some of the bent grasses, especially on heavily thatched or matted greens, fared badly. Some of the late fall arsenical treatments aggravated injury. Experience this spring justifies further investigations of their uses, especially lead versus calcium arsenate. The latter is more drastic and lead is safer.

Thatched turf is generally shallow rooted. It fares badly whenever weather is severe, winter or summer. The peat-like thatch stays overly wet and creates ideal conditions for snow mold and for every kind of summertime fungal disease. A more detailed discussion of it is planned for the January issue of GOLFDOM.

Poa annua has become a curse and a blessing on watered fairways in the North. On many of them it is the only or pre-dominating grass. In times of bad weather

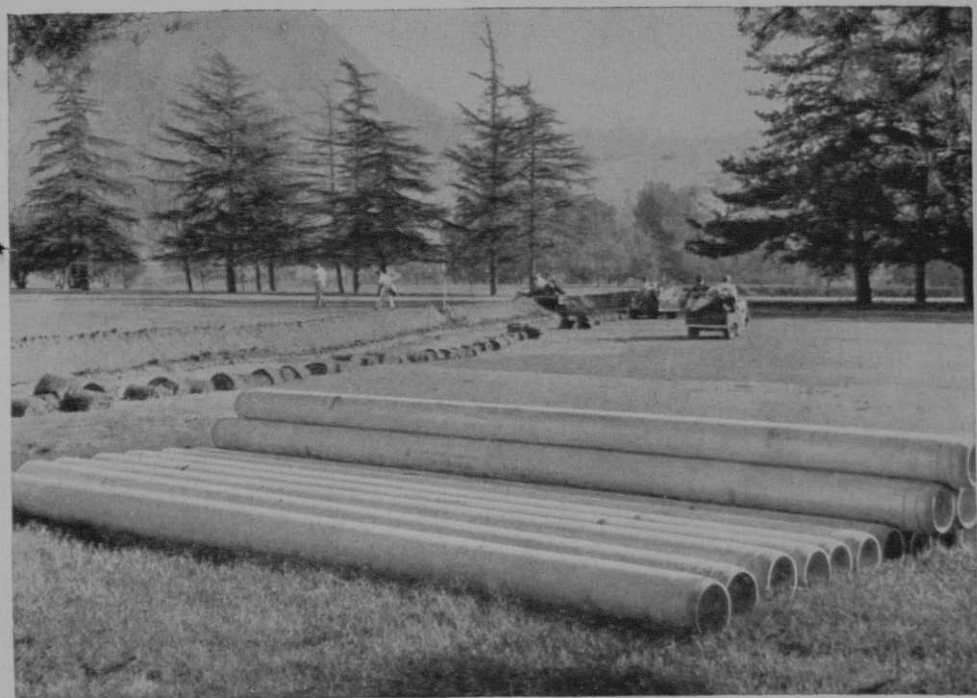
poa is the first to die. By the same token, it stages a quick recovery the moment weather moderates and conditions become favorable for germination of poa seed always present in the soil.

### Poa Seems to Survive

That is one of the reasons why reseeding with other grasses is disappointing. It is a matter of competition and seedling poa annua seems to win the battle for survival.

Watered approaches are especially bad with respect to poa infestation. Repeated turning of tractor and fairway mowers in these confined areas is one of the ways good grass is lost and then the same thing happens to the poa. At some clubs self propelled triplex mowers are being used to mow approaches, instead of tractor drawn gang mowers. The switch has helped preserve grass on these areas.

Some clubs have given up reseeding of approaches as hopeless, yet there has been progress. The problem is deserving of wider experimentation to develop an economical, sure way of eliminating the poa and substituting a good grass. A few clubs have resorted to sodding. At one club several bad approaches are being sodded with Merion Kentucky bluegrass. It is proposed to cut these areas with a triplex power



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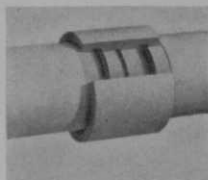
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mower. Creeping bent predominates elsewhere on the fairways and will be cut at about one-half inch, which is a bit too close for Merion.

### Herbicide Knowhow Needed

The insidious damage to fairway bent grasses by the indiscriminate use of 2,4-D, 2,4,5-T and other chemicals is not realized by most people. Both of these herbicides have helped the spread of poa by weakening the bent. It is time to re-evaluate their effects and find the conditions under which they can be used with impunity because they are useful tools. There is some evidence that even Bermuda in the South is suffering by overdoing 2,4-D in conjunction with arsenicals for the control of goosegrass and hard-to-kill hairy crabgrass.

A return to Kentucky blue and fescue might seem like the right answer to the fairway turf grass problem. The use of Merion Kentucky bluegrass has been proposed.

Originally, fairway turf was mostly Kentucky blue and fescue. Then came fairway watering. Close cutting and lots of water doomed both of them. Bents took their place if present in the old turf. Otherwise, it was poa annua, clover, and knotweed. Bents seemed like the answer on watered courses, and may still be best

in many places. To stop fairway watering is like trying to ban the electric car.

The damage to Kentucky blue grass by the foot rot stage of leafspot has been forgotten or overlooked by those who think it the best answer now. We need to learn how to avoid or prevent leafspot.

### Temperate Zone Grasses

In the more temperate parts of the North, bluegrasses alone, or in conjunction with fescue, continue to be the most likely grasses for fairway use, with bents still the most likely answer on watered courses.

Use of Merion Kentucky bluegrass has been proposed because of its great immunity to leaf spot. Merion seems to thatch as badly as bent turf, so control of it will be necessary, if true. Merion has been used on a few new fairway seedings. Its performance is said to be satisfactory so far. Time will tell the story. Up to now reseeded Merion Kentucky into existing turf areas has been disappointing.

A 50-50 mixture of Kentucky and Merion Kentucky blue has done well in Miche Stadium at West Point Military Academy. Further testing would seem justified.

Despite some loss during the past winter, Bermudagrass and zoysia performance



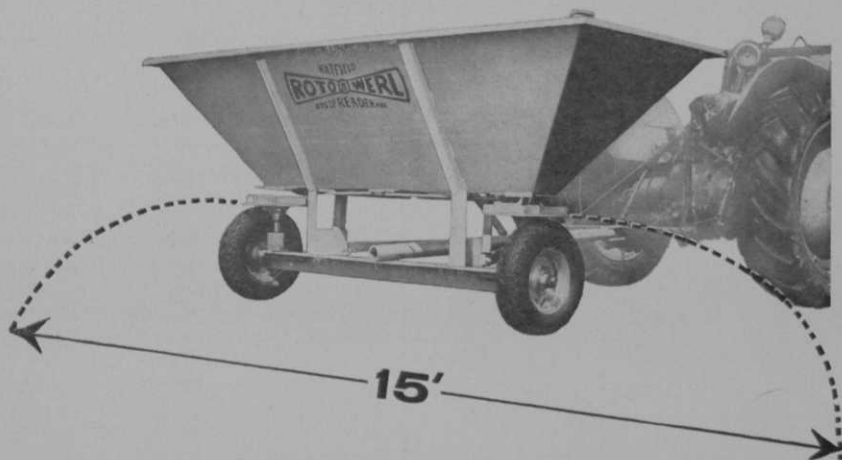
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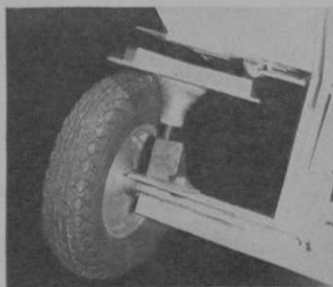
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has been promising in the fringe belt from Washington and Philadelphia across to Kansas City. Pine Valley is expanding its program with these grasses despite a slight setback in some spots. The original U-3 Bermuda fairway at Bala in Philadelphia has been outstandingly good. U-3 has done well in St. Louis and Kansas City.

At Municipal Stadium in Philadelphia a good, dense Bermudagrass turf was obtained from seed in 5 to 6 weeks in 1958 and again in 1959. Seeding was in early June and the turf cover was good by mid-July. Seeded Bermuda might be a good temporary cover for summertime use.

There is some resistance to Bermuda fairways by golfers unaccustomed to it. This will subside in time if turf performance continues good.

*To be concluded in January.*

## Fred V. Grau's Turf Roundup

(Continued from page 54)

is there always enough money to rebuild a poor green but not enough to build it right the first time?"

Research data on excesses of water are lacking. Data on excesses of nutritive elements also are difficult to find in print but there is being accumulated evidence that high levels of phosphorus are detrimental and may contribute to "wilting" and similar symptoms.

Work in Rhode Island has led to the formulation of a 20-6-4 formula for general turf use. Plots that have received a 10-0-4 ratio for 30 years are in good condition with roots 20 inches deep mining phosphorus from lower levels. Indiana work has led to the development of a 10-3-7, 12-4-6 and similar formulas. The 20-4-6 formula may not be far distant. It is well known that some of the yellowing of grass can be corrected, temporarily at least, with a light application of iron, either sulfate or in the chelate form. Also it is known that yellowing is associated with high phosphorus.

Research shows that iron is precipitated by phosphorus, creating insoluble compounds in which neither element is available to the plant. When the reaction takes place within the plant we find the insoluble precipitate blocking the channels in which water and nutrients move about. The result may be "wilt" which, if not corrected quickly, could bring about death of the grass.

## Nitrogen and Water

The similarity in appearance between nitrogen-hungry grass and turf suffering

from drought has been documented in thousands of plots at dozens of experimental stations. Observations on courses confirm this close relationship. It has been interesting to note that when turf is furnished with adequate N (always in balance) water use is reduced. The condition that lead to the excess use of water having been corrected, there is an encouraging trend toward minimum water use.

Proper balance of nutrients has been shown in research at Penn State. When nutrients are out of balance, diseases actually may increase in severity. Some forms of nitrogen, which depend upon bacteria for ideal release, may fail to function properly because of a serious imbalance in relation to other elements. Poor drainage, or an excess of water combined with heat and humidity, may result in far greater damage when an imbalance exists. Soil and tissue testing have been of great help in detecting an unbalanced nutrient condition. Studies have been made of trouble areas where, in an effort to "do something", the material used added to the difficulty. No effort had been made to learn the existing level of nutrients. When questioned, the answer was, "I just thought the grass needed it."

### Management by Analysis

Most of the data that are accumulating on soil and tissue tests are not available in usable form. A careful analysis of the test results would have great value in guiding future feeding patterns. It is safe to say that we are at the beginning of a great change in procedures wherein more and more of the management practices will be based on a careful technical analysis of the existing condition before action is taken.

Among the management procedures that have developed on the sound basis of research perhaps none is so universally accepted and used as that of aeration. The application of the principle of aeration has been responsible for tremendous saving of turf. In the midst of heat, humidity, saturation and confusion, many supts. saved their weak and ailing turf by aerating. Machines that embody this principle constantly are being improved thru factory research and tests on turf. Player resentment of aerating during the height of the playing season has diminished. Improved machines leave a smooth unruffled putting surface. Better aeration enhances the effectiveness of plant nutrients, especially those that have a close relationship with soil organisms. Without adequate oxygen, beneficial soil

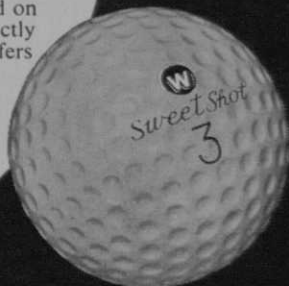
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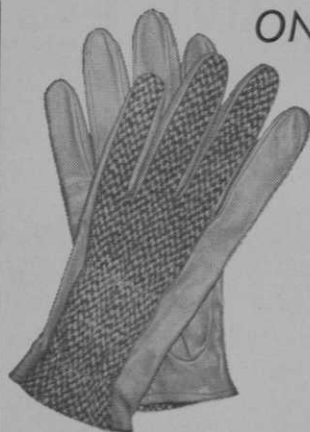


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organisms can not operate to the advantage of the system. Without ample oxygen, plant roots can't absorb water or needed nutrients. Aeration helps to restore balance in the soil-plant relationships.

#### What Tests Have Shown

It is impossible to measure the tremendous value of the research that has been accomplished over the past 20 years in the discovery and development of improved methods of feeding plants. Turf has been the recipient of much of this research; first, in the USDA, then in industry, and later in experiment stations. The net result is higher quality turf and more foolproof results with less labor. Research at various stations has shown that a properly-formulated fertilizer can release nitrogen steadily to turf over an entire growing season from a single application. Practical experience dictates that, on heavily-watered greens, for example, two applications provide steadier feeding than a single application. In year 'round climates, four applications are preferred by most supts. for the greens, two on tees, fairways and lawns.

In the balancing of nutrients for turf, tests are impossible to measure the value of trace elements in helping to achieve the most desirable release patterns for all nutrients. There are strong indications that some of the effects are catalytic wherein only minute quantities are required at relatively long intervals to trigger reactions. The term "controlled release" also may be applied to the trace elements wherein micro-nutrients are melted into a glass which is then ground to the proper degree of fineness to provide the desired release rate.

This is different from the chemical union of urea and formaldehyde in which the process develops molecules of varying sizes which are attacked by bacteria in direct relation to the size of the molecule, not according to the particle size.

#### Morning Watering Important

The "dew" on grass early in the morning largely may be water of guttation. During the night, when humidity is high and evaporation is almost nil, roots continue to pump water out of the soil into the plant. In order to avoid an explosion, Nature provided little openings called hydathodes to relieve the pressure inside the plant. The water that is squeezed out of the leaf is charged with nutrients absorbed in solution from the soil. When the so-called dew (some of it is, of course) dries on the leaf, the close observer can detect tiny white crystals of nutrient compounds. When the concentration of nutrients is high enough and the conditions are just right, the grass blades may be "burned." A general browning of the turf may show for a few days. Most supts. syringe the excess water off the grass to wash the plant food back into the soil and to help the turf to dry more quickly for earlier maintenance and play. This early morning watering was found, thru research, to significantly reduce summer diseases on greens. Some of the troubles this season can be traced to a neglect of the early morning watering principle.

Research in establishing turf in the past has limited the level of nitrogen in the seedbed to about 1 lb. of N to 1,000 sq. ft. More recent work at Rhode Island has established the most desirable level of N