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SETS THE PACE IN SPORTS

Fertilizer Solution Use in Turf Maintenance

By ANTHONY B. LONGO

Greenkeeping Supt., Yale University Golf Course, New Haven, Conn.

In some respects the use of fertilizer solutions can be regarded as a recent innovation, especially on golf courses, however the practice of using fertilizer solutions is not a new one. Our ancestors used fertilizer solutions years ago in applying liquid manures to growing crops. In some parts of the world, notably in some Asiatic countries, the use of liquid manures is a common practice.

Although the practice may be new to some of us it has been with us for generations and it can be safely assumed it is here to stay. With this view in mind it seems that the subject of fertilizer solutions would bear some importance for a discussion on some of its advantages and disadvantages and how it compares with other methods of fertilization.

The factors that influence the selection and use of different types of fertilizers are many and space does not permit us to outline them all here. We can consider a few of the outstanding factors; namely, the effect of the fertilizer on growth of the plant and cost of the fertilizer. The effect on growth of the plant is greatly influenced by the type and availability of the plant nutrients contained in the fertilizer and the rate at which these nutrients become available to the plant. On the item of cost, we can consider cost of the materials and the cost of application. Many other factors must be considered if we wish to determine whether to use a dry or liquid fertilizer exclusively. Much research and experimental work is necessary and it is doubtful that a conclusion on that subject could ever be reached. This discussion then shall be limited to the use of fertilizer solutions in conjunction with our other methods of fertilization.

Weigh Claims of Use

Many claims have been made as to excellent results obtained from the use of fertilizer solutions and the advantages of solutions over dry applications. Some of these claims should no doubt be subjected to some analysis and investigation.

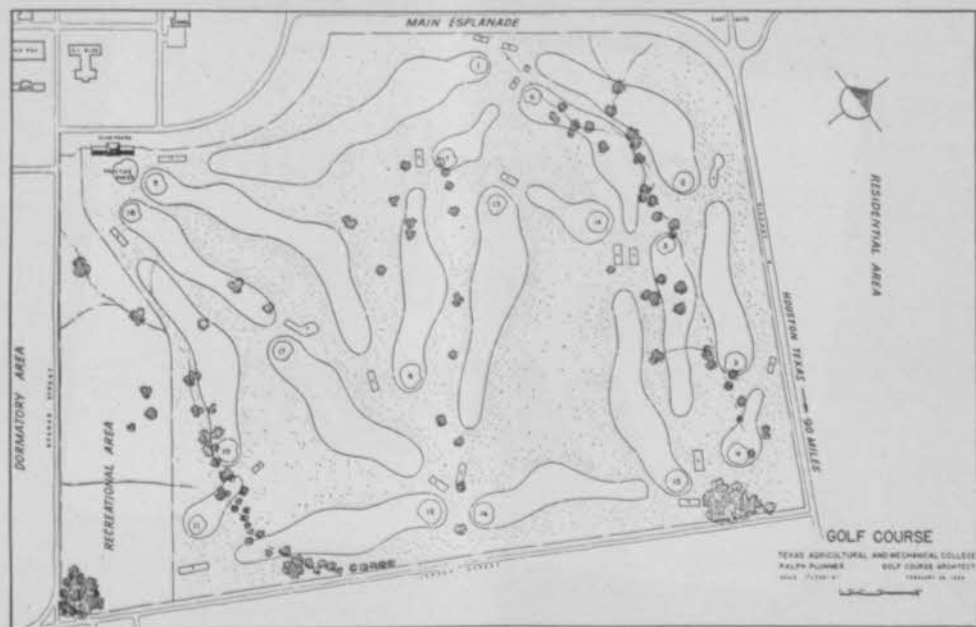
Many greenkeepers have used fertilizer solutions with satisfactory results especially during summer months. Some of us find that during abnormal weather condi-

tions it becomes rather difficult to control the rate of growth of our putting green turf with water insoluble fertilizers. The availability of plant nutrients from water insoluble fertilizers is mostly dependent on bacterial action in the soil. Bacterial action is influenced by soil, temperature and moisture conditions. We can partly control soil and moisture conditions, but we cannot very well control temperatures in our putting green soils. Under these conditions we may find it more convenient to control growth with readily available water soluble nutrient materials. Water soluble plant nutrients can be applied either in dry form or in solution whichever method we find to be more convenient and economical.

Let us bear in mind that any water soluble nutrient salt when applied dry, readily forms a fertilizer solution when it combines with water either in the soil or on the surface. Then it would seem that all other factors being equal, the same plant foods could be applied either in dry form or in solution with no difference in effect on plant growth. On this basis then, for materials that can be conveniently applied either way we have to consider only the factors of convenience and cost of application in choosing the method to apply them.

Preventing Fertilizer Burning

Most water soluble salts have a "burning" effect on plant foliage and turf grasses when applied dry and allowed to remain on the leaves or blades a certain length of time especially if there is some moisture present on the leaf surface. Extreme care and expert workmanship is essential in the application of these salts to avoid injury to turf. These salts must be washed off the blades of grasses very soon after application or brushed off by mechanical means. The factors involved in the use of water soluble nutrient salts also apply to the so-called chemical fertilizers as chemical fertilizers contain a high percentage of water soluble salts. In many cases only small quantities of water soluble fertilizers are needed to provide the amount of plant food required and it becomes necessary to increase their bulk by mixing them with sand or compost to



TEXAS A & M COLLEGE COMPLETING COURSE

Agricultural and Mechanical College of Texas will have its 6,800 yd. course, designed by Ralph Plummer, completed this fall. Plummer is supervising construction of the attractive and testing course. Par will be 71. Two winding creeks and about 50 traps are used in providing interesting hazards on the course which will serve the 3,000 Texas A&M students in the dormitories adjacent to the course and the rest of the 7,000 student body living elsewhere on the campus within easy walking distance of the new layout. Working with Plummer on the job are Dr. R. C. Potts and A. W. Crain, resident members of the Texas Turf Assn., and J. C. Fagen, mgr. of the course. Potts and Crain will conduct research on course turf. Fairways and greens are Bermuda. A fine strain to approximate bent putting conditions is being sought. The course is completely watered. In addition to the Texas A&M Open championship for the school's students, program for the course includes an intra-mural competition involving 800 team members, Southwest Conference events, Texas annual High School championship and a heavy volume of individual play and instruction. The USGA also is to be invited to play its Junior Amateur championship on the new course and it is hoped to have the National Intercollegiate played on the course.

obtain better distribution over the turfed areas. These factors all influence the cost of application.

Fertilizer solutions can be prepared so that the solution will not have any burning effect on the turf, applied with power spraying equipment and not necessarily watered in immediately after application. Fertilizer solutions can also be applied in combination with many turf fungicides and insecticides. With this method there is a great saving of labor, consequently a lower cost of application.

Fertilizer solutions may be prepared by many methods. Any water soluble fertilizer can be applied in solution, but for solutions to be applied with spray equipment we are limited to use only fertilizers that are clear and free as possible of insoluble matter that may clog strainers and spray nozzles.

Solutions supplying nitrogen alone can easily be prepared by dissolving in water proper amounts of ammonium sulphate, ammonium nitrate or urea. Solutions with the three primary elements will include proportionate amounts of water soluble phosphate and potash salts. The subject of preparing solutions is by itself a lengthy one. Probably the simplest method of preparing solutions is by diluting in water any prepared and commercially available concentrated fertilizer solution or by dissolving a prepared mixture of water soluble salts formulated specifically for making solutions. It is advisable to follow manufacturer's instructions on rate of dilution of these materials if one is not thoroughly acquainted with their use. Application of the dilute solutions can be made at rates recommended by the manufacturer or at rates determined by the

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150 LaPorte, Ind., youngsters get their first golf lesson in a program which has resulted in the organization of their group into the Junior Golf Association. Boys and girls get six lessons, play for two months, use of free golf clubs and transportation to and from the golf courses for \$1 fee.

Pros Help LaPorte Juniors Get Started in Big Golf Program

By JOE EYLER

LaPorte, Ind., noted for its good golf and golfers in the northern part of the state, has added something to its regular golf program this year which should be of interest to other cities.

A junior golf program providing instruction, regular play and a handicap tournament—all for the cost of \$1 for each youngster—was conceived last fall and put into operation this summer.

So far the program has been an outstanding success with over 100 youngsters from the ages of 12 to 18 enrolled.

Tom Boyd, an enterprising LaPorte insurance salesman, should rightly be called the father of junior golf in LaPorte for he has been the driving power behind the plan which is providing healthful recreation for youngsters as well as teaching them the fundamentals of a game they can enjoy far into adulthood.

Boyd called an informal meeting last October and interested Pros Herman (Butch) Uebele of LaPorte's municipal Beechwood course and Pat Hall of the privately-owned Elks Country club in the plan and the LaPorte Junior Golf association was born.

Both pros have been enthusiastic backers of junior golf in the past and offered to go

along wholeheartedly with any plan which was set up.

The first problem was to collect enough used clubs and balls so that every youngster would have equipment.

The LaPorte fire department volunteered to cut down the used clubs to junior size and to renovate them. Boyd and the Herald-Argus, the daily newspaper, canvassed the town during the winter months in search of used clubs. About 355 clubs were collected and repaired and are now in use by the junior golfers.

Both the pros and Boyd agreed that in order to be a success the program would have to be within reach of all youngsters regardless of their financial status. All agreed that there should be a very nominal fee charged so that boys and girls would place some value on the program.

Charge \$1 Fee

A \$1 fee was decided upon for the first year with the money going into a fund to help defray the costs of the program. This fee has proved to be satisfactory this year and probably will be continued next year.

Both Uebele and Hall very kindly offered their time as instructors and the facilities of their clubs were made available to the juniors on a scheduled basis.

The program this year was set up to start with a series of six lessons, stressing golf etiquette and care of the course as well as golf fundamentals. Two lessons were given each week immediately following the close of school and then the youngsters were on their own and allowed to play two mornings a week from 8 to 12 on the two courses. During the final month of the program a handicap tourney was run with three flights each for boys and girls competing and suitable prizes awarded.

It is planned to retain the six-lesson plan but each year as the children become more advanced they can be separated into an advanced group for special training. The new entrants in the program each year can continue to receive the "basic" series of six lessons.

Two months prior to the close of school, principals of LaPorte High school, Central Junior high school, six grade schools and four parochial schools were furnished with application blanks for the program.

Schools Cooperate

The principals co-operated splendidly and the program was widely publicized within the schools. Children were asked to sign up for the program, giving such vital statistics as height, experience if any and whether or not they needed clubs, in addition of course, to their names, addresses and ages.

When the blanks were collected shortly before the end of the school year, 157 boys and girls had signed cards with about 65 per cent of them in need of clubs. It was felt that a minimum of five clubs—one wood, three irons and a putter—would be sufficient for each youngster.

Boyd formed an advisory board consisting of three businessmen, the local high school principal, the sports editor of the local paper and the two pros besides himself.

The function of this board was to arrange the program and help with the supervision. The youngsters themselves would elect officers and actually run the association.

The problem of transportation to the Elks Country club was one of the first to come up before the season started and was solved almost immediately. The Elks club is about two miles from the city and the advisory board felt that parents would be unwilling to have their children bicycle or walk the distance across busy highways.

A bus was chartered for the trip at a minimum of 10 cents a head for each trip and the cost was financed by the \$1 dues.

Two weeks before the program was to start a meeting was called for all those who had signed up for the program as well as any interested parents. Over 100 attended and the two pros spent a busy evening answering questions.

The program got under way the week following the close of school. To facilitate instruction it was decided that boys would get their lessons at Beechwood on Monday and Friday mornings while the girls would be at the Elks Country club on the same mornings.

Louis (PeeWee) Pelz, assistant pro at Beechwood, was added to the staff as an instructor as was Wilfred Harrow, an amateur.

The youngsters were split up among the instructors to facilitate handling.

Following the series of lessons the boys and girls were able to play Mondays and Friday from 8 to 12 at each course. Each youngster was asked to play as many nine-hole rounds as possible so that handicaps for the tournament could be established and so that each youngster could show his interest by playing on his own initiative.

Six business firms eagerly snapped up a chance to sponsor trophies for the flight winners in the tournament while two others donated the second-place gold medals and the third-place silver medals. Each contestant in the tourney will get a bronze pin, paid for by local business men, as a participation award.

The tournament started Aug. 9 with nine-hole qualifying rounds. Contestants alternated play at the two courses in match



Professionals Marilyn Smith and Jimmie Thomson of the A. G. Spalding staff are joined by local pro Herman (Sonny) Uebele (L) and Rudy Boyd in exhibition match and clinic arranged for the LaPorte junior golfers.

play in flights according to age until Aug. 20 when the championship flight finals for boys and girls is slated in 18-hole matches. Other flights will conclude play Aug. 21.

In order to maintain a working fund for the purchase of new clubs and to pay for incidental expense, Boyd arranged an exhi-

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GREENS STAY GREEN

FOR CHAMPIONSHIP PLAY AT

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"Effective control of fungous disease with 'Tersan' is the way we keep our greens in tip-top shape," says Raymond Didier, greenkeeper at the Tam-o-Shanter Golf Club. "'Tersan' is easy to apply and safe."



Tam-o-Shanter Golf Club, Niles, Ill.

This picture story is another in a series of "experience reports" from well-known golf courses, coast to coast.



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"We can keep our greens at their best with 'Tersan,'" Mr. Didier reports. "It is excellent for control of brown patch and does not burn the grass. Depending on the weather, we use 'Tersan' at least once every ten days. Since 'Tersan' is so easy and safe to use, anyone can use it without burning the grass or even retarding its growth," Mr. Didier adds. " 'Tersan' saves lots of time and labor because it mixes easily with water and needs no special wetting-in."

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BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Potassium Cyanate Passes Crabgrass Control Tests

By WILLIAM E. ZIMMERMAN

(American Cyanamid Company)

As a result of studies conducted the past two years at the laboratory of American Cyanamid Co. in Stamford, Conn., and leading eastern experiment stations, potassium cyanate, was discovered to possess herbicidal properties sufficient to kill many weeds growing as pests in agricultural crops. Crabgrass, (*Digitaria* Sp.), was noticeably affected by the chemical, in these 1946, '47 screening tests.

It looked like something had at last appeared promising for controlling crabgrass. There was a lot yet to be learned about the material. How would it work out in turf? Would it respond well in other sections of the country on principal turf varieties?

While testing chemicals for crabgrass control in the summer of 1948, at the New Jersey Agricultural Experiment Station, Drs. Gilbert Ahlgren, Dale Wolf and Ralph Engel, and their assistants, observed that the effectiveness of potassium cyanate was greatly increased when a wetting agent was added to the solution. Further observations and tests revealed that this combination would not only kill crabgrass without permanent turf injury, but the amount of chemical required for the job was materially reduced.

Further substantiation of these observations, in Rhode Island and Connecticut, in the 1948 season, indicated that perhaps something had been discovered for safe and effective material with which to combat crabgrass. Potassium cyanate looked so promising in the 1948 turf trials, a more complete study of the material was planned for the next season.

Testing During 1949

A comprehensive study was initiated during 1949 with potassium cyanate. Suggestions for its use as a crabgrass control chemical were sent to many leading research stations throughout the United States and parts of Canada. Tests at the various experiment stations were desired in order to try the material under as many variable conditions as possible. More information regarding weather, soil moisture, grass tolerances, number of applications and other factors was considered essential before statements could be made

regarding potassium cyanate as crabgrass killer.

In this program of testing, the Pennsylvania State College, the experiment station at Cornell University and the University of Maryland were instrumental in initiating several new series of crabgrass control plots at critical areas in their states. Many other studies were started at other state and federal experiment stations. Included in these were crabgrass studies at Beltsville, Maryland, where the Green Section of the USGA and Weed Investigations Section of the U.S. Bureau of Plant Industry, conducted cooperative field tests. Also the Georgia Coastal Plains Experiment Station at Tifton, Georgia, conducted a series of studies on the effectiveness of chemicals for crabgrass control on southern varieties. In addition to this program, Canadian and more intensive studies by American Cyanamid Co. personnel, and other commercial research workers in the Pennsylvania, New Jersey, New York and Connecticut areas resulted in much pertinent information regarding the use of potassium cyanate for crabgrass control.

Potassium cyanate has proved itself to be a non-corrosive, non-combustible, and easy to apply chemical. Its low order of toxicity to humans and other warm blooded animals, marks it as an outstanding chemical for crabgrass control and will be available for such purpose during the 1950 season. In addition to these qualities, potassium cyanate will destroy many other weeds including chickweed, veronica, milky-spurge, knotweed, goosegrass and other difficult to kill weeds found in turf.

Rates for Crabgrass Control

Eight pounds of potassium cyanate per acre, applied twice or at the most three times, with 100 to 400 gallons of water, should be sufficient to kill crabgrass in branched, seed-head stage. Smaller seedling growth usually is killed with one eight-pound treatment.

Sixteen pounds applied once gives excellent kill under normal conditions and applied twice kills older matted crabgrass much better. Wetting agent, added to the solution, at the rate of 0.1% solution

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