

bacteria and returned to be mixed with more air and more sewage. Proper chlorination of this treated waste water will kill more than 99% of the harmful bacteria in the effluent. — Remember I said *bacteria*. The secret to this process is a super saturation of bacteria and air.

Lets discuss the terms associated with waste water.

Sludge — the solid matter that settles to the bottom, floats or becomes suspended in the sedimentation tanks and must be disposed of by filtration and incineration or by transport to appropriate disposal sites.

Primary Treatment — the stage in basic treatment that removes the material that floats or will settle in sewage. It is accomplished by using screens to catch the floating objects and tanks for heavy matter to settle in.

Secondary Treatment — second step in which bacteria consumes the organic part of the wastes. It is accomplished by bringing the sewage and bacteria together in the trickling filters or in the activated sludge process.

Suspended Solids — small particles of solid pollutants which are present in sewage and which resists separation from the water by conventional means.

Now lets get down to the "brass tacks" or basics. What is the effluent or "once used" water really like? First it is an excellent media for growth — a beautiful liquid fertilizer. The water I was working with contains 7.3 pounds of actual N per 1000 sq. ft. per year. This N was 8.1 ppm organic or slow release and 17.5 ppm inorganic or that N that may be taken up faster. Phosphate equals 30 ppm. Potassium equals 104 ppm. Also the water contains sodium, calcium,

magnesium, iron, zinc, sulfur, boron, copper and molybdenum. Ph is 7.7. Great stuff — all required elements. Good Ph — Perfect! However there are a few problems:

Salts — May be high — as much as 1000 - 2000 ppm. — be careful — test your water — test your soil — know what is going on. Remember: less than 650 ppm salt useful, 650 -2000 ppm must use periodic leaching, more than 2000 ppm limited usefulness. Also remember least tolerant grasses: Highland, Colonial Bent, Kentucky Bluegrass. Of seven creeping Bents — top growth slowed as salt increased. Arlington, Seaside, Pennlu, Old Orchard — most tolerant. Congressional and Cohansey intermediate. Penncross least tolerant. Also having medium tolerance is perennial rye, tall fiscue and orchard grass. Most tolerant are all the bermudas.

Sodium — may be high — ours was 104 ppm — continuous use of effluent may allow Na to clog clay particles — decrease drainage and could be fatal to some soils. Seaside found to be most tolerant to alkali conditions.

Heavy Metals — these cannot as yet be removed in territory treated water. These may collect in some soils and cause problems. However, this is more a problem in highly industrial areas. Also our calcariuous soils precipitate out some of these therefore causing us a small problem, however, these metals end up somewhere in our world.

Last and by far the most apparent and troublesome is algae growth. Our water fresh out of the plant looked like tap water. Of course if you drink it, you are going to be very busy for awhile for it actually would be a "dose of salts". As

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soon as this water is exposed to sunlight we have a tremendous bloom of algae. I have seen it 6 - 8 inches thick floating on the surface. It clogs valves and sprinklers. It smells and feels greasy. It dies and floats to the surface as a dark brown heavy froth and it was mine, and it will be your job to convince your employees and players that it is algae and not something else. However everything is not what it might appear to be and that reminds me of a story. — Chicken hawk story - Lark, Dove, Duck-(Drake).

This brings up another problem and that is people. People and their opinions. Many feel effluent is dirty. Course employees don't like to work in it. Players are very sensitive to getting water on their clothes. There may also be problems with uninformed people drinking out of sprinklers and we already know where he is going to spend some time. Seriously, those working with effluent should keep up on all immunizations because as we said before, chlorine kills bacteria, it does not to my knowledge kill virus. Nothing that is available today kills all virus. If we could discover this procedure, I am sure we would have the cure for the common cold.

Effluent is here to stay; It should be used!

California law AB 1784 (papan regulation) Section 13550 of California's western code makes it illegal to use fresh water on a golf course if effluent is reasonably available. Now convince me, we as superintendents are not going to have to live with it and learn about it. Some solutions to our

problems have been: Dual water systems may be necessary for greens — one system effluent and one system fresh water to be used to leach out salts, sodium (after calcium applications) and heavy metals. Leaching rule: 6 inches water to remove 1/2 salts in 1 foot soil — 24 inches water to remove 9/10 salts in 1 foot soil.

Algae — Do not allow the effluent to stand in the sun. Allow no exposure to the sun. Take the water out of the plant straight into the irrigation system or into a closed tank. Also add strainers or sand separators to the system as insurance. Use "dirty water" irrigation parts. There are some available on the market.

Another aspect is education. The people associated with the course must be educated. They must be convinced on the use of effluent. Remind them that grass purifies. 60% of the water used returns to the environment pure. An 18-hole golf course, if watered 1 inch can absorb four million gallons of water. Remind them that grass produces oxygen. One acre produces enough pure O² for four people for one year. And 18-hole golf course produces enough for the life support of 1,000,000 people and it is clean and pure.

Then after all this you might want to write a letter to Santa Claus expressing your desires. Maybe it should go something like this:

Dear Santa Claus:

Please leave me 18 greens that will be proof against wear

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and tear, disease, bugs, unreasonable players and other pests. Please leave at Tom Smith's house: one durable soft rubber putter which may be cast violently on the ground without injuring the turf on my greens. Please leave at Ed Jones's house one digging fork and a spade in order that he may have something to dig with in his back yard to satisfy his craving for digging and thus relieve the strain on our tees. Please leave some message of inspiration with the Royal and Ancient and the USGA which will encourage them to adopt a new cup with a diameter of at least ten feet so that in the future it may be feasible, if there are any missed putts, to blame them on the player rather than on the superintendent. Please leave your message of good will firmly fixed in the haughty hearts of our members and make it last at least for many months and make it possible for the superintendent to actually enjoy his work within a month after he found it necessary to close the course for a single day.

If you will do all this dear Santa, you need not visit my house. We'll take care of the kids this year.

Humbly yours,
The Superintendent

Thank-You

Editor's Note:

Bob Sanders, CGCS is the Golf Course Superintendent at the Skyline Country Club, Tucson, Arizona.

Our thanks to Bob and the other fine people who keep sending us first rate articles to keep "The South Florida Green" No. 1 in Turf Publications.

We try to print only first run articles and we welcome any topic that a turf related person would like to share with our readers.



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Florida Greenkeeping

By LYMAN CARRIER

EDITOR'S NOTE: This article reprinted from the October 1927 edition of "The National Greenkeeper" is believed to be the first article ever written about a Florida golf course. We thank the G.C.S.A. for permission to reprint this article.

Editor's Note:—Mr. Carrier was for many years connected with the U. S. Department of Agriculture, as agronomist in pasture and forage crop investigations. His work with the U. S. G. A. Green Section established the value of vegetative creeping bent for putting greens.

MOST Florida golf courses appear neglected in summer. Golf there has in the past been considered a winter pastime. The courses have been built largely to meet the demand of the northern tourists who sojourn there for a few winter months. When the tourist season is over in the spring maintenance operations are cut to a minimum or cease altogether. The finer grasses languish and die out. Crab grass, Bermuda and a few weeds make a struggle for existence. In the fall there are hurried preparations to put the course again in condition for play. The greens are cut and raked and reseeded to redtop, rye grass or something similar. Greenkeeping under such conditions lacks something which the northern greenkeeper enjoys—there is not the satisfaction of creating a permanently beautiful scene.

There are lots of people who live in Florida the whole year and the play on some of the public golf courses where an attempt has been made to keep up playable conditions prove that the game is as popular there in summer as it is in the North. Some greenkeepers in Florida, however, seem to have the idea that the period of summer neglect is a necessary feature of golf course maintenance.

Black Muck for Top Dressing

Ray Tower of the Forest Hills Golf Course, an excellent course located near Tampa, does not subscribe

done that way for years and many think it is the only way it can be done successfully. Tower had had experience with vegetative planting and could see no reason why the stolons could not be cut into short pieces and planted broadcast the same as is done with creeping bent. He finally persuaded those in charge to let him put in a green by his method. The result was a decided saving in labor and the ground was completely covered with turf in a much shorter length of time.

Ray Tower is a firm believer in the liberal use of fertilizers under Florida conditions and it is difficult to see how good turf can be produced otherwise on thin sandy land. The Florida greenkeepers have much more freedom in the choice of fertilizing materials than have those in the North.

In the North where the bent grasses predominate for putting green purposes it has been proved to be advisable to keep the soil in an acid condition. To do this only such fertilizers should be used as do not leave an alkaline residue in the soil. This necessitates cutting out such common materials as nitrate of soda, acid phosphate,

to this theory. When I visited his layout late in June he had the best summer turf on his putting greens I ever saw in Florida. He was giving them the same care as is customary to give greens during the season of heaviest play. The Forest Hills Course was designed and built under the direction of J. Franklin Meehan, the well known golf architect and landscape artist of Philadelphia. Construction was started in January, 1926 and the course was ready for play the following October. The soil at Forest Hills is sand the same as is the case on nearly all of the Florida courses. During the construction the putting greens were given a covering of five inches of black muck from the bed of an old pond. Mr. Tower considers this top soil of muck over the sand as highly important in the matter of production of all-the-year-round turf in Florida. It keeps the loose sand from shifting, holds moisture, and as it is composed mostly of organic matter it furnishes more plant food to the grass than will the natural soil of the region.

Planting Bermuda by New Method

The greens were planted with Bermuda grass by the vegetative method. It is customary in the South to plant the Bermuda stolons in shallow trenches. It has been

bone meal, and potash, leaving ammonium sulphate and ammonium phosphate as the only common commercial goods that are safe to use.

Bermuda Needs Plenty of Fertilizer

With Bermuda grass this restriction does not apply. There is no danger of promoting the growth of clover in Florida by the use of an alkaline fertilizer and all that Bermuda asks for is a square meal and is not overly particular about what it is fed. A good fertilizer for turf should carry a high percentage of nitrogen, about half as much phosphoric acid as nitrogen and a small amount of potash.

Experiments with *Poa bulbosa*, the new winter bluegrass for the Southland, at Forest Hills gave very promising results. Although not planted until January it made sufficient growth so it was cut three times before it died down with the beginning of summer. If this is a sample of what is to be expected from this interesting little grass it may be suitable for use on the Bermuda greens instead of the redtop or rye grass to give the green turf during the winter.



Lyman Carrier

Guest Editorial

Open letter to Florida Golf Course Superintendents

By TIM HIERS



Tim Hiers

Florida has the second largest golf course industry in the nation, ranking only behind California. Recent growth and construction statistics indicate that within five years Florida may surpass California in total number of golf courses.

Yet when it comes to representation within the GCSAA the Sunshine state hovers near the bottom of the totem pole. Only one president of the GCSAA in the last 51 years has been from Florida and the board of directors representation fits in the same category. As a result of this past poor representation a great majority of research funds and national programs have not been directed toward problems concerning Florida's golf courses and their respective superintendents.

The state of Florida is not out to gain control of the GCSAA but merely to obtain equal representation and recognition. This situation cannot be fully corrected by Florida superintendents joining the GCSAA individually. In order for a meaningful and productive change to come about it is necessary for us to unify and support the GCSAA in the form of a strong and well-organized statewide association.

This can be accomplished without effecting the operation or identity of the individual local superintendents associations.

In essence the purpose of the Florida Golf Course Superintendents Association is to improve communications among the local associations and to form a strong unified group of associations that have common goals in mind. This will directly benefit the individual superintendent who is shackled with such imposing problems as the possible energy crisis, precious chemicals being taken off the market by the EPA, lack of communications and service between superintendents and their suppliers.

In October of 1978 the four presidents of the original Florida State Golf Course Superintendents Association met in Orlando to nominate and elect me as your statewide president. Since that time we have had two meetings. An attorney, Bob Hoffman, was hired to lay the groundwork for articles of incorporation and by-laws. At our first meeting on Dec. 8, 1978, in Orlando, several amendments were made to the original articles of incorporation. Included in these were Amendment 1, to change the name from Florida State Golf Course Superintendents Association to Florida Golf Course Superintendent's Association and Amendment 3, to include all existing associations and future associations in the FGCSA. The president of your association has a copy of the articles and amendments.

Due to the organization becoming inactive in 1973, we had to re-file through the state to become an active corporation. When these proceedings have been accomplished, the new articles of incorporation will be printed and distributed. At the December meeting we asked the presidents of the local associations to collect \$2 from each superintendent. Dr. Harry Meyers, professor from the University of Florida, was the first to contribute his \$2.

These limited funds have assisted in the reorganization of our association. In our last meeting at the Holiday Inn Central in Tampa March 8 we reviewed the amendments and laid groundwork for the future. Bill Wager was appointed head of the by-laws committee and hopefully they will be submitted and approved in our August 26 meeting in Melbourne.

On Monday Aug. 27 the third annual Crowfoot Open will be held at Suntree CC in Melbourne. Consult your local association and plan to attend this tournament as we hope to use this as our annual state meeting. We also hope for the possibility in the future of changing the South Florida Green to the Florida Golf Course Superintendents Ass'n magazine. In the eventual formulation of membership fees we hope to include a weekly subscription to Florida Golfweek to each superintendent as a tool for ongoing communication across the state. This could include articles on a weekly basis from local associations.

Some people may be quick to point out previous failures of the state association even though competent and hard-working people were involved. Unfortunately support they received, if any at all, from across the state was not unified. We believe that because of the growth of Florida, a better means of communication and more concerned individuals the Florida Golf Course Superintendents Association will be a useful tool and an outstanding success.

In closing I would like to emphasize that our association is not affiliated with Florida Turfgrass Association. The FTGA is simply interested in our future success and is willing to lend a helping hand. It is my hope that each superintendent across the state will extend his cooperation to his local association in their support of the statewide organization.

I want to personally thank Charley Stine, publisher of Golfweek, for contributing his time and interest in the progress of our association. He has agreed to provide a free subscription to each individual member until such time as the Florida Golf Superintendent's Association can incorporate a subscription into the membership fees. I request the president or secretary of each association to send Golfweek a mailing list of their respective members.

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