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SUMMARY OF PROCEEDINGS
ANNUAL CONFERENCE OF THE
MID-ATLANTIC ASSOCIATION OF GOLF COURSE SUPERINTENDENTS

Under the Auspices
of the
Extension Service
University of Maryland

Lord Baltimore Hotel
Baltimore, Maryland
January 6 and 7, 1964

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SUMMARY OF PROCEEDINGS

The annual conference of the Mid-Atlantic Association of Golf Course Superintendents with 143 in attendance was called to order by Dr. George S. Langford, State Entomologist, University of Maryland, College Park, Md. This was followed by an address of Welcome by Dean Gordon M. Cairns of the University, and the Presidential Message of James E. Thomas, President of the Association.

The first day was climaxed with a social hour and an evening banquet. Speakers at the banquet were: Dr. Wilson H. Elkins, President of the University of Maryland, and Roy W. Nelson, President, Golf Course Superintendents Association of America. Sponsoring the social hour were F. W. Bolgiano and Company, Washington, D. C., G. L. Cornell Company, Bethesda; Custin's Baltimore Toro, Inc., Baltimore and National Capital Toro, Inc., Silver Spring, Maryland.

Aside from the talks mentioned, and the summaries of the addresses indexed, was a closing discussion on Mid-west Methods with information about some of the activities of the Golf Course Superintendents Association of America, by Roy W. Nelson, President of the Association.

The program committee consisted of Sheldon R. Betterly, Frank J. Haske, George S. Langford and Thomas A. Doerer, Jr., Chairman.

PROS AND CONS FOR BERMUDAGRASS IN THE MID-ATLANTIC REGION

A. M. Radko
Eastern Director, USGA Green Section

Changes take place slowly in turfgrass management and the use of Bermudagrass in the Mid-Atlantic area is a good case in point. Question of its use has been debated for some time and certainly it will be debated for some time to come. Early usage was limited to seeded varieties, but it was not until some of the finer bladed strains were found to be winter hardy that Bermudagrass gained in popularity. U-3 became the most widely used strain, while coarser-bladed common types also found limited usage. Later other select strains followed. Year after year more and more golf course superintendents converted their programs to include more and more Bermudagrass for fairway and tee turf. A few began "all-out" propagation on the basis of excellent year to year performance...until 1963...when for the first time significant winterkill occurred. The debate looms even larger now. This is why this grass has been a topic of controversy these many years -- what are its strong ... and what are its weak points for use in the Mid-Atlantic area.

Weak Points

- (1) Poor cool-season color ... in normal year Bermudagrass is dormant from approximately October 15 through April 15 ... though play is possible and good lies are afforded, the turf looks poor in comparison with the vibrant green color of the cool-season grasses in spring and fall.
- (2) The golf season is stretching each year and heavy play on dormant Bermudagrass weakens or even kills the Bermuda in areas of heavy traffic. Weeds encroach or take over...Poa annua especially...and offers severe competition to the Bermudagrasses in certain years.
- (3) Bermudagrass encroachment into green, traps, flower beds, etc., is always an unpleasant possibility.
- (4) Finer bladed Bermuda strains grow so dense and tight that it becomes difficult to introduce cool-season grasses into them.
- (5) It is not easy to convert cool-season turf to Bermudagrass on unwatered fairways. Normally summers are dry and soils become extremely hard. Summer planting requires irrigation to insure rooting of the Bermudagrass, and to keep it growing.
- (6) Management during the conversion period is touchy ... you want the conversion to take place gradually.
- (7) Extra labor is required to propagate Bermudagrass vegetatively. Normal maintenance must go on uninterrupted during the establishment period. Not all clubs are willing to purchase a planting machine for this task.
- (8) Bermudagrass is a heavy nitrogen feeder, and an accelerated program of maintenance is required.
- (9) Bermudagrass forms a thatchy turf, and this is always a possibility in the Mid-Atlantic though to date thatch formation has not been the severe problem it has been further South.
- (10) Fine Bermudagrass strains for fairways are reportedly hard on the wrists of some golfers.

- (11) Bermudagrass must be cut close frequently for best performance. When it is cut close more winter weeds encroach though not severe, they are pesky.
- (12) The fire hazard question always comes up and is a more psychological rather than a real disadvantage. We have not found it to be a problem in this area.
- (13) Bermudagrass will not stand wet feet.
- (14) Bermudagrass will not tolerate conditions of shade.
- (15) Winterkill of even the hardiest strains will always be a question in the minds of many since the 1963 season was such a tough one on Bermudagrass.

Strong Points

- (1) Bermudagrass provides excellent turf for golf during the summer and most of the golfing season.
- (2) Bermudagrass competes favorably and crowds-out crabgrass and other serious summer weeds.
- (3) Bermudagrass takes traffic better than cool-season turf during the summer months. A stronger factor with the increasing use of electric, gas and hand carts.
- (4) Bermudagrass will persist on banks, mounds, on steep slopes where other grasses normally would not do well.
- (5) Bermudagrass will provide better cover on small tees than cool-season grass.
- (6) Bermudagrass can be mowed without injury as close as terrain permits.
- (7) Bermudagrass will grow under a variety of soil conditions...in sand, clay or silt...though it will spread fastest in sand.
- (8) Once established a good yearly increase can be expected under normal conditions.
- (9) Bermudagrass is highly resistant to herbicides...and so can be sprayed when noxious weeds are present without fear of weakening the Bermuda.
- (10) Once a turf is established, Bermudagrass does not require irrigation in the Mid-Atlantic area. It is highly drought tolerant.
- (11) Bermudagrass is seldom troubled by disease in the Mid-Atlantic area.
- (12) With a good Bermudagrass base, cool-season grasses can be introduced to provide a combination turf.

WINTERKILL ON BERMUDA GRASSES

Holman M. Griffin
Northeastern Agronomist, USGA Green Section

The most winterhardy of the Bermudas yet released and the one most commonly used at present is U-3. Since 1938, U-3 Bermudagrass has found increasing favor and has been used more and more in the Mid-Atlantic as a tee and fairway grass. U-3 is adapted to the northern Bermudagrass region where it is normally too cold for common Bermuda and also to the southern bentgrass-bluegrass-fescue region where it is too warm for the cool season grasses in summer. Climatic factors gave Bermudagrass a big setback this year all through the eastern United States but U-3 still remains a good answer for what to grow in the transition zone where it is difficult to grow any type of grass.

There is no reason to suspect that cold weather alone killed the Bermudagrass this year since U-3 has survived freezing tests to 28° below zero. Also hothouse tests were made by individual superintendents which proved the grass was still alive after the worst of this winter had passed. More likely, what happened was that the spring temperatures were just high enough to break dormancy and not high enough to produce growth and the roots and rhizomes rotted in the ground. Normally U-3 begins to grow at 50° F. and will continue to grow at even cooler night time temperatures if the next day's temperatures are 70° or above.

Bermudagrass also has a tendency to brown off and become dormant when the photo period or intensity of daylight is decreased and little if any food is manufactured by the plant under these conditions.

Should the grass experience some cloudy days along with a lack of moisture and extended periods of temperature between 45° and 55° F. in the early spring when it is trying to initiate growth, I feel it is very damaging and these were precisely the conditions which prevailed over much of the country this spring.

Of course these were not the only damaging factors as I will try to show later with slides. Traffic was also to be considered as a major factor contributing to the winterkill of Bermudagrass through compaction of the soil and exclusion of soil air and moisture.

Other important factors discussed at the Rutgers Field Day were height of cut and fertility level. The fact that too much nitrogen can cause damage in cold weather has been known for some time. If the plants go into the winter in a lush condition, the cells are much more easily damaged by ice formation.

We cannot tell exactly how height of cut influences winter hardiness, but it was noticed that the higher cut grasses survived much better. This was all brought home by the fact that the fringes of the Rutgers' test plots and many golf course roughs which were higher in cut and lower in fertility survived the winter much better.

Although Bermudagrass has been grown in the Mid-Atlantic for the past 25 years there is still relatively little positive knowledge about its management and certainly not enough to bring us through a year such as the one just past. We can only hope that the next 25 years will bring us some improved Bermuda strains and some technical answers so badly needed.

BERMUDA ON OUR COURSE - HOW IT SURVIVED WINTER KILL

J. Frank Haske, Superintendent
Washingtonian Country Club, Gaithersburg, Md.

This could be the shortest talk of the Conference by saying it didn't. But this wouldn't be fair to Bob Shields who follows me as he would have to talk for an hour. It certainly is a pleasure to be back on the program again and especially to talk about Bermuda grass at our course. Only this time under different circumstances. Last January I spoke on how we managed U-3. This past season I wish we had had it. So, in the next few minutes, I would like to share my experience and observations with you and try to determine what may have been the real cause of heavy loss of U-3.

As a fair estimate I would say our losses exceeded 60% on our fairways and 80% on our tees. Our loss followed no particular pattern, which seems rather unusual. As a matter of fact we had any combination you could come up with. High and low areas, northern and southern exposures, there was no difference. One area that came back reasonably well was our 16th fairway. Our loss here was about 50% though we were protected on the entire north side by heavy trees. Our 3rd fairway faces north and it is wide open to the winds. This fairway came in about the time as No. 16 and the kill was about the same. This particular fairway I would have given up as a total loss. Another example - our 6th tee was one of the finest we had as far as coverage. It is elevated at least 30' above the fairway running north and south. Our loss on this tee was about 20% where our fairway 30' lower was a complete loss. Here again there was no consistent pattern. I would have thought the tee would have gone first due to its location. It is quite obvious that Mr. Winter Kill plays no favorites in any particular location. Some of our best fairways where coverage was excellent and facing south were hit as badly as those facing any other direction.

I am sure none of us need to be reminded of the winter we experienced last year. I think we can truly say that this was the worst we have witnessed in 25 years or better. Not only were the Bermuda's affected, but other species of grass, deciduous trees, evergreens and a variety of plants and shrubs were wiped out. Our course was no exception. I can recall on numerous occasions when the temperatures were -8° as well as one period of 28 days or better that it never exceeded 30° . By normal standards, it really doesn't get this cold until after January but last year it started early in mid-November. Our fairways and tees were frozen to a depth of 18". I know because we tried to plant some trees in March. Then you must remember how warm it got in March for a brief spell, then it turned real cold up until April. Under these circumstances, how could we expect anything short of a miracle that any of the U-3 would survive.

As the weather started to break we began our vigil...April, May, June and still no sign of Bermuda. By this time panic set in and we had to make a quick move in order to have something to show the members - who were beginning to press us. The case of the missing Bermuda became the topic of the day at the Club...and I was running out of answers. At this point I began to wish I had tee to green carpeting, which Mr. Eig had once suggested in concern over the cost of growing grass. I would have welcomed crab grass!

So without delay we proceeded with our program to oversee the fairways and tees with Arizona Hulled Bermuda. In preparation, we started thatching just as deep as we could with two Roger's Aero Blades. We literally removed tons of dead material. By running two machines we were able to complete the job in one week. Much to my amazement the fairways looked much better after removing the thatch though we had very little grass left. As soon as the fairways were swept clean, we began seeding at the rate of 60 lbs. per acre with a Brillion seeder. We watered day and night until we were assured of a catch, which took several weeks. And, incidentally, this is where a fairway system really comes into play. Without it we would have been dead.

Our first application of fertilizer was made in late June. We used a 16-8-8 at the rate of 500 # per acre. In July we used 100 # Nu Green per acre and in August we followed up with the same application as we made in June. Our tees were fertilized every two weeks from June thru August. Though they received their usual amount I know we fell short on the fairways compared to what we have applied in the past. After we got a reasonably good stand with the Arizona I felt what we applied was adequate. This coming season we are planning to increase our quantities considerably.

During August and September we thatched the fairways and tees and swept them immediately. I whole heartedly recommend this operation for those who have Bermuda. I feel it not only stimulates the growth but aids in its overall general appearance.

By mid-July some sign of the U-3 began to appear. It came in in splotchy patterns throughout the course. At this point we were most happy that we had seeded the Arizona when we did because we were beginning to get coverage and the pressures from the membership were easing considerably. As we scanned the fairways, tees and roughs to see what we had going for us, we observed that where the U-3 was cut at 2" or better we had no appreciable loss. Berms of the tees and roughs came in with exceptional vigor, but where we maintained our close mowing it was evident at this time that we had severe kill. We had to maintain a regular mowing schedule up through late October because of our Washingtonian Invitational. This year the tourney was set up in September so after October 1st, we let the fairways grow. We are anxious to see what effect this will have on the survival of the Bermuda. I believe there may be some merit to this if you can get away with it. I also observed that where we built additional tees, the Bermuda came back 100%. I used at least 30 - 40 tons of sharp sand in a 3000' tee area. Can it be that we must consider using more sand during construction? This has given me something to think about because generally our soils are extremely heavy. On any future renovation or construction of tees, I will continue to use high amounts of sand because I think this might be a key to holding our Bermudas.

As if the severe freeze and cold weather were not enough, we were also faced with another climatic disaster. I refer of course to the drought. From May to October we had only 20.75" of moisture. Over 12" of this came with two intense storms and we lost most of it with runoff. We cannot say these storms were a total loss. At least they kept our ponds full and assured us of adequate water for the season.

We hope the U-3 that came back made some progress. My chairman and the membership are still enthusiastic about it. So, as it stands now, we are willing to give it another try and start replanting as soon as we have something to plant. This past season we didn't take the time to plant the first sprig because we just didn't have any. When we did, it was getting too late and we thought it best to postpone it until this year. We feel we are due a winter like this every so often, but because we gotlobbered once, we are not ready to throw in the towel. We feel the U-3 is a good, hardy Bermuda and I know personally that it has survived well in this area since 1948. Of course, if these problems should persist year after year, then we would have to consider making a change. So, to summarize our situation, I feel that the actual loss of our U-3 Bermuda was caused by a combination of several unusual conditions, such as:

- The extended cold spell which started early in November and continued until April.
- Sub-freezing temperatures and the deep frost line.
- Lack of moisture due to the drought in the summer and fall.
- Soils too heavy - not enough sand in our tees.
- Mowing too close too late in the season.
- Fertilizing too late in the season.

Now what precautions could we have taken that were overlooked? Could we have avoided the winter kill? Would this have been one of those instances where over-seed-

ing with rye would have been a help? We would have at least had coverage in the spring. As you know, over-seeding with Rye has not been too popular in this area because it tends to hold back the progress of the Bermuda. It seems to me our hands were tied - it was a killing winter and let's hope we don't have another like it. Experience is after all I guess, the best teacher. What text book would have imagined the set of circumstances that brought about our dilemma? We have learned that some precautions may be taken, but what mother nature can get us into is just part of the business of being a golf course superintendent. And how you rise above it is in part ingenuity, part luck and hope that the good Lord is with you.

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BERMUDA GRASS AT WOODMONT

L. R. Shields, Superintendent
Woodmont Country Club, Rockville, Maryland

The weather caused considerable damage to U-3 Bermuda grass at Woodmont during the winter of 1962-63. There was damage on high ground and low ground, on northern and southern exposures and on protected areas as well as on exposed areas. The most severe damage occurred on low wet areas (proving again that Bermuda grass does not like wet feet) and on areas shaded by trees on the south. The least amount of damage was on high ground that sloped to the south and was exposed to the sun.

One notable fact was that there was no loss of turf in any of our three U-3 nurseries although they are exposed to the same management practices such as mowing, fertilizing and aerating. They do not receive artificial irrigation, as do regular fairways, and are not subject to player traffic.

We have had U-3 growing on several tees for over 15 years and had never experienced winter kill until 1962. Many times during this 15 years the temperature has dropped as low or lower than it did in 1962, so we believe other factors were involved. One was the unusually warm spring which shot the temperatures to over 90° in April and stayed there for several days, then dropped down to below freezing again. Perhaps the grass started to grow and was caught by the late freeze. Another factor could have been the open winter with high wind and not much snow cover.

To counter the damage done we spiked, fertilized and watered in order to get as much early growth as possible, then followed a regular program of these operations all summer. We also cut the grass higher and sprayed to keep out the competitive crab grass. On large areas where grass was slow to fill in we replanted using our planting machine and stolons from the undamaged nurseries.

On the tees a section large enough to meet the requirements of play was resodded and was soon back in service. The surrounding area was sprigged, topdressed and kept watered until the U-3 started to grow, then put back on routine tee maintenance. Some tees were planted to new strains of Bermuda grass to test for more hardy varieties. Other tees were mulched in late fall in an effort to get them through the winter.

Very late in the year all tees were sprayed with mercury as a disease preventive, then later on they were top-dressed heavy to add new soil bacterial and perhaps keep the surface a little warmer. As a further test we over-seeded some areas with rye grass, but we doubt if results will prove worthwhile because the seeding was done too late in the season.

We hope that the U-3 Bermuda grass that did survive the severe winter will be even more winter hardy than before and we will continue our planting and replanting during the coming season.

SOILS AND THEIR RELATIONSHIP TO BETTER GRASSES

J. F. Shoulders
Associate Extension Agronomist, V.P.I.

We have said many times that the soil is basic and fundamental in the successful growth of plants on a field basis. This statement is certainly true when applied to the successful growing of turfgrass. When the soil at hand does not possess the characteristics necessary for growing quality turf we then modify the soil so that it will grow the turfgrass satisfactorily. An appropriate example is the preparation of a topsoil mixture for golf greens.

Before discussing the soil let us consider some factors that are essential for plant growth and see how closely they are related to the soil in which the plant grows. I will limit these to factors outside of the plant which are necessary for plant growth. These are: (1) light, (2) mechanical support, (3) heat, (4) air, (5) water, and (6) nutrients. The soil functions in making 5 of the 6 conditions available to the plant; the exception is light.

The first step in plant growth is the germination of the seed. The mature seed contains a small living quiescent plant. When factors such as moisture, temperature, and air are right, the seed begins the germination process. The first stage is the adsorption of water. When planted in soil, the rate at which water is adsorbed depends on the availability of water in the soil, the compactness of the soil around the seed, temperature, and, of course, the nature of the seed coat. Too little water or loose soil around the seed may retard or prevent germination. Excessive compaction of a moist soil may limit the supply of oxygen and therefore also prevent germination. Conditions must be favorable for successful germination and the soil is the regulator which either maintains satisfactory conditions or fails to do so.

As the seedling develops and the plant continues growth, it requires a constant supply of water, nutrients, air, especially oxygen. The soil, through the soil solution and soil air is an important agent in making these available to the plant. Roots must grow and enlarge if top growth is sustained. Thus the physical condition of the soil is a factor. Hard, compact soil restricts root development as well as failing to provide good soil air and moisture relationships.

What is soil? Soil may be defined as the link between the rock core of the earth and the plants which grow on the surface. Soils vary widely. We think of good soil as a living dynamic body, in which plants, bacteria, and even small animals live. It is a physical, chemical, and biological system in which each factor is closely related to all others. Mineral soil consists of 4 substances (1) mineral matter or decayed rock fragments, (2) organic matter or decaying plant and animal matter, (3) air, and (4) water.

The mineral substance consists of rock fragments classified into the following: small gravel, sand, silt, and clay based on the size of the particle. The amount of each of these constituents present determines the texture of a given soil. We are particularly interested in textures because of the relationship of soil texture to resistance or susceptibility to compaction.

Let's look at these mineral separates of soil briefly:

<u>Soil Separate*</u>	Diameter*	Screen or Sieve Size	
	limits mm	Will Pass	Standard No. Held on
Very coarse sand	2.00 to 1.00	10	18
Coarse sand	1.00 to 0.50	18	35
Medium sand	0.50 to 0.25	35	60
Fine sand	0.25 to 0.10	60	140
Very fine sand	0.10 to 0.05	140	330
Silt	0.05 to 0.002	---	---
Clay	Smaller than 0.002	---	---

*U.S.D.A. Classification

None of these separates by themselves make a desirable soil although each contributes desirable characteristics. Sand (and fine gravel) resist compaction, increase aeration and drainage (by maintaining large pore space) and tend to keep a soil loose and friable. The chief disadvantages are the small nutrient and water-holding capacities. Clay has a much higher nutrient holding capacity, higher water holding capacity and is adhesive. Its adsorptive capacity for water, gases, and soluble salts is high. However, clay compacts easily when wet. It is subject to such severe compaction that it can prevent air and water movement as well as penetration by roots.

Silt has some plasticity, cohesion, and adsorption characteristics but to a much smaller degree than clay. From the standpoint of turf, large amounts of silt are generally undesirable.

Organic matter is important in the physical condition of soil. It promotes granulation, increases water holding capacity, and is the main source of energy for soil micro organisms.

The soil water or soil solution contains at least traces of every element present in the soil, and is the medium from which plant roots take in water and nutrients. The soil solution should not be considered as simply a water culture because it is continuously renewed and constantly changing. It is greatly dispersed and exists at least in part in minute sub-division, some of which may move rather freely while some may be held tightly with little movement. It is subject to intense adsorption by the soil and varies markedly in concentration, and position within the soil. It is influenced by the addition of water as well as from the lack of water. A desirable balance between the mineral components, organic matter, soil air, and the soil solution is essential for desirable plant growth.

The soil air is also dynamic and subject to constant changes. Any fluctuation in soil water automatically increases or decreases the amount of air present. It differs from the air above ground in that it contains a much higher concentration of carbon dioxide from decaying organic matter, and less oxygen and nitrogen. It is not continuous, but highly dispersed and adsorbed by the soil colloids and in the soil solution. Normally, the relative humidity of soil air approaches the 100% level, creating a condition favorable to the growth of soil organisms. Because of its dynamic nature, the soil air presents to roots and micro organisms an atmosphere favorable to almost any type of biochemical activity.

As producers of high quality turf, we are much concerned with the arrangement of the soil particles or structure of the soil. In general there are two basic kinds of soil structure: (1) single grained - as with gravel or loose sand, and (2) massive - in which single particles are held together to form granules. These granules may be large or small and its stability weak or strong, depending on

circumstances. The soil particles are interspersed with humus which acts as an adhesive to hold them together into granules. For many areas such as fairways, lawns, etc., we must use the natural topsoil and manage it in such a way as to maintain satisfactory physical condition. In doing this, we take advantage of the qualities that nature has built into good topsoil and which make it an ideal medium for growth.

The difficulty of maintaining satisfactory structure under heavy traffic when the soil is wet is the chief reason that modification of a topsoil, otherwise satisfactory for plant growth, is necessary for golf greens. The breaking down of granulation results in compaction and eventually leads to a soil condition in which the grass plant cannot survive. Therefore, we modify topsoil by adding large particles such as sand which will not break down and organic matter to maintain as much as possible of the desirable features provided by the clay in an unmodified topsoil.

The practice of soil modification for golf greens, athletic fields, and other turf areas subject to heavy traffic has caused much concern and searching for a satisfactory solution for many years. Recently, there has been a great deal of differences of opinion among those concerned with this problem as to the most satisfactory materials and amounts to use for long-lasting and satisfactory results. Certainly many of the difficulties which plague superintendents can be traced to the physical condition of the soil mixture and related areas in the construction of his greens.

One of the factors which adds greatly to the problem of soil modification is the amount of variation found in the topsoil to be used, both in the amounts of the sand, silt, and clay present and in the kind of clay contained. Some clays expand and shrink immensely under varying levels of moisture, while others are little affected. Fortunately, in Virginia, for example, there are not too many instances in which the kind of clay causes a problem. We are faced, however, with a large variation in the content of sand of the various sizes, silt, and clay. We at V.P.I. are convinced that a mechanical analysis of the topsoil considered for use either in construction or as topdressing is essential before attempting modification.

Consider for a moment the basic soil conditions necessary for satisfactory turfgrass growth: (1) a soil conducive to adequate root penetration and growth, (2) good aeration, (3) good moisture-holding properties, (4) satisfactory internal drainage, (5) favorable conditions for the activity of desirable soil organisms, (6) adequate nutrient holding capacity, (7) freedom from conditions which cause toxic or undesirable chemical activity. The first 5, and to some degree the last, factor are closely related to the physical condition or structure of the soil.

For Virginia soils, we believe at present that we can most nearly satisfy the above conditions by using a topsoil mixture for greens that contains from 50 to 60% of the coarse and medium grades of sand (this can include a small percentage of fine gravel), 10 to 15% clay and approximately 10 to 15% organic matter.

The sand used should be at least 80% coarse and medium sand. The amount of sand used should be based on a mechanical analysis of the topsoil. Look for a moment at the mechanical analysis of fine greens in Virginia which have performed very well.

Mechanical Analysis of Fine Putting Green Soils in Virginia (% of Each Separate)

Green	Gravel	Sand			Total Acceptable Coarse Material	Sand		Silt	Clay
		V.C.	C	M		F	VF		
A	n/a	10	18	20	48+	15	11	10	16
B	n/a	10	19	21	50+	16	9	11	14
C	9	4	13	22	48	16	6	21	9
D	7	13	19	11	50	5	3	27	15
E	8	10	16	12	46	7	5	29	13

These greens all approach the percentages given earlier for coarse sand and clay. I will be the first to admit that many greens which do not meet these specifications are also performing quite well. However, a very large number of problems on greens with which I have assisted over the past several years have been caused by the physical condition of the mixture. R. E. Schmidt and I have worked with a number of courses over the state in determining the topsoil mixture to use for greens and so far as I know where the specifications were followed and the components uniformly mixed, the greens have functioned satisfactorily insofar as the soil is concerned.

In recent years several studies of interest concerning soil modification have been made. (See references at end of this article).

After you have determined the soil mixtures which is best for your situation, these are other important conditions which must be satisfied to assure proper functioning of the mixture on the green. Drainage, including (1) a drainage system under the mixture and (2) surface drainage; uniform and thorough mixing of the soil, sand, and organic matter, and using at least a 12 inch depth of the mixture after settling are among the most important of these factors and merit careful consideration. It also follows that once you have used a satisfactory soil mixture in construction you should continue to use the same mixture for topdressing to minimize layering.

In conclusion, soils are the medium in which grass grows. Grass requires air and water in the correct proportion, satisfactory physical condition for root penetration and growth, and a balanced supply of nutrients to make the growth desired for high quality turf regardless of where you grow it. By understanding the basic requirements for grass growth and how the soil functions to provide them and having a knowledge of your specific soil, you can better manage your soil to maintain high turfgrass quality.

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TURF: SOILS AND FERTILIZER RELATIONSHIPS

Dr. J. R. Miller, Head
Department of Agronomy, University of Maryland

The amount of turf grown in the Mid-Atlantic States for golf courses, home lawns, roadsides, athletic fields, cemeteries, airports, and other areas is increasing at a very rapid rate. For example, in Maryland alone there are 91 golf courses and 8 new courses are under construction. The number of home lawns has also been increasing rapidly in recent years. During the period 1950 to 1959, approximately 100,000 homes were built in Maryland whereas in 1930 to 1939, only 89,000 homes were erected. At the present time it is estimated that Maryland has more than 1 million home lawns and approximately 33 million dollars are spent annually for their maintenance. Sod production is becoming a very important agricultural enterprise. A recent survey showed that almost 7,000 acres of sod with a total value of approximately 2 million dollars are sold annually from Maryland farms.

The use of the proper amounts of lime, fertilizer, and organic matter are very important in the development of a good turf on the above areas. To use these materials to best advantage in growing turf grasses, one must consider some of the basic fundamentals regarding soils.

Soils are composed of air, water, minerals, and organic matter. The mineral fraction of the soil consists of various size particles (gravel, stones, sand, silt, and clay) and through the action of weathering many of these particles release plant food for use by the growing crop. However, the quantity of plant food supplied in this matter is not sufficient to meet the needs of turf grasses and additional nutrients must be supplied from commercial fertilizers or other sources.

The nutrients added to soils and those released in the weathering process are held primarily by the clay particles and the fine organic matter in the soil. The clay particles are very small in size (less than 0.0008 of an inch) and have a negative charge. As a result of this negative charge, the clay has the ability to attract plant nutrients that have a positive charge (such as calcium and magnesium in lime, and the potassium found in turf fertilizers) thus reducing their loss by leaching. On the other hand, plant food elements which possess a negative charge such as nitrate nitrogen are not strongly attracted by the soil and can be easily leached. Since nitrogen in this form is easily leached from soils and relatively large quantities of nitrogen are contained in grasses, this plant food element is usually recommended for turf grasses at higher rates of application than phosphate or potash. In addition to nitrate nitrogen, the phosphates also have a negative charge. However this plant food element does not react like nitrate nitrogen in that it forms insoluble chemical compounds when added to the soil. As a result, very little phosphorus is lost by leaching and there can be buildup of this nutrient in the soil when large amounts of phosphate fertilizers are used.

The organic matter portion of the soil is also very important because of the many useful effects it produces. Some of these are as follows:

1. Increases water-holding capacity
2. Improves aeration (especially heavy clay soils).
3. Promotes good tilth.
4. Helps to hold plant food in soil.

PROPER USE OF TURF FUNGICIDES

Robert T. Miller
E. I. du Pont de Nemours & Co., Wilmington, Del.

My subject, "Proper Use of Turf Fungicides," is a broad one. Many of you now practice a form of preventive maintenance by applying fungicide regularly. Is that all that is necessary, or is there something more that can be done to make fungicides more effective? Every manufacturer would like to think his product is the complete answer. But no one chemical or piece of equipment is a complete program in itself. Even a greens mower is useless if you have no fertilizer to grow the grass. When you have the grass, you have one of the essentials for disease -- the host. With the host present, the parasite -- if it hasn't already arrived -- will be there shortly, and disease control must include more than the regular application of a good fungicide.

Our place as a manufacturer of turf fungicides and nitrogen products is to supply you with the best products possible and to experiment in an effort to improve these products. We should suggest management practices, to make our products and others that you use perform more effectively and give greater satisfaction in terms of high quality turf.

The best products when used improperly often fail. I know of no product in the turf field that cannot be reduced to ineffectiveness unless it is applied under sound management practices. There is no product that can take the man out of management. We have said, and will emphasize, that anything you do on your greens will either accelerate or reduce disease incidence. Normally, we consider three possible ways to control turf diseases:

1. Use of resistant strains. This would be the ideal way, but to date there is no strain of grass, as far as I know, that is resistant to all organisms known to attack turf.

2. Employ good cultural practices that will encourage strong, healthy, vigorous plant growth and in that way discourage disease.

a. Good soil structure to allow soil drainage and encourage healthy, deep-rooted plants.

b. Proper pH is important because soil nutrients are most available to the plant between 6.0 and 7.0.

c. Provide adequate available phosphorus and potash for the soil.

d. Provide good air circulation and water surface drainage and more than one direction.

e. For control of mat and compaction, there are several good tools available, such as the spiker, vertical mower, hollow tyne fork, or aerification machines. These machines can be of great assistance in maintaining a golf course. Use them to your advantage. Top dressing and the use of lime also will be helpful in reducing a mat or puffy condition.

f. Use iron as a spray to maintain better color. There is probably plenty of iron in the soil, but as the pH gets near the neutral point, iron is tied up and additional applications become necessary.

g. An adequate amount of nitrogen fertilizer is needed for good color, turf density and texture. There are three types -- soluble, organic, and ureaforms.

The soluble materials are the least expensive per unit of nitrogen. Their feeding period is short and strict observance to application rates is needed as they may burn. Their use is most expensive from a labor standpoint.

The organics last a little longer, are safer to use, and do not require the strict measurement of application rates. Labor costs are less than with soluble types. However, usually they are quite low in nutrient value, and therefore, larger quantities are needed per application. Also, they are more expensive per unit of nitrogen than the soluble forms.

The ureaforms are safe to use and will release nitrogen at a desirable rate throughout the growing season. Usually two applications are sufficient to feed bent grass for a year. This means, of course, that relatively high rates of nitrogen are required per application to provide the total nitrogen needs for the entire growing season. The nitrogen cost, like organics, is more than solubles, but the product is concentrated, and application labor cost is the least of any nitrogen form.

With all of these products, it helps to know how they work effectively. We believe the superintendent using any form of nitrogen should adapt his program to conform with the nitrogen he uses rather than to try to adapt the material to his program. Finally, the amount of nitrogen used should be kept in balance with the phosphorous and potash.

There are other cultural practices, such as use of insecticides, weed killers, nematocides, etc.

3. The final control of turf diseases is through the use of chemicals. We believe the best use of chemicals for disease control is in a complete program -- the resistant strains of grass, the best management or cultural practices, a good fertilization program, and the regular application of a safe effective, preventive fungicide.

It is our belief that the best chance of controlling disease is to prevent it. We recommend the use of a fungicide on a regular program, usually every seven to ten days, in an effort to set up a preventive barrier so that the organism or fungi cannot get to the plant. There may be times when the interval between sprays will have to be reduced and the rate of spray increased.

Your job of growing grass on a golf green is entirely against the rules of Mother Nature -- you cut too short, you are pushing the grass during what is mainly a dormant or slow growing period, and if it is still alive, it is being trampled by the golfer. There is more pressure per square inch exerted on the turf by the average golfer than any piece of equipment. Multiply this by the play per day

In conclusion, the growing of a good turf on a golf course is not easy. Nor is it an insurmountable task. The more we study disease, the more we become aware of the inter-relationship between environmental factors and cultural practices. Cultural practices alone will not control disease. But good cultural practices, coupled with regular preventive fungicide applications, will keep disease under control. It may be necessary to change these applications and practices as environmental factors dictate. You, as golf superintendents, are in as competitive a field as any manufacturer. Practically all of your members, or in the case of a public course, those playing greens fees, are constantly comparing the condition of your course with other courses they have played, and there is no average over a season. The golfer always pictures your course in the condition it is in when he plays it. It behooves you as a superintendent to have your course in the best possible condition every day of the playing season.

THE CLUB MANAGER, THE PRO, AND THE GOLF COURSE SUPERINTENDENT
THEIR RELATIONSHIP TO EACH OTHER

Thomas A. Doerer, Superintendent
Fort Belvoir Golf Club, Fort Belvoir, Va.

Superintendents, Club Managers, Golf Professionals and Guests. My subject relationship is a very broad one, also a very complex one, so I consulted the dictionary and these are my findings.

Relationship is only a twelve letter word, but it certainly contains a lot of meaning in our everyday association with our Golf Professional, Club Manager, and memberships at our respective courses. The word relationship as Mr. Webster describes it carries this meaning - "The state of being related."

Certainly then the above message is the purpose of this wonderful group being assembled here today.

As President of the Middle Atlantic Golf Course Superintendents Association, I would like to make a few comments as to our position or feelings relative to club management, golf professional, greens chairman and others who may directly or indirectly affect the progress of his club and its membership.

According to national statistics the game of golf is now a multimillion dollar business, not just a game as it was some 15 to 20 years ago. A great deal of this money is invested in real estate necessary to the construction of the course. During construction and in most cases after construction this valuable property is entrusted to a qualified Superintendent. This of course makes the Superintendent a valuable executive to his club. The Superintendent has the responsibility of spending anywhere from \$50,000 to upwards of \$150,000 of the members money for labor, machinery, construction, and long range planning. With the responsibility of the above expenditures, the Superintendent is thrown automatically in close association with his manager, golf pro, greens chairman and club president. If your Superintendent is not part of this departmental operation, he has not in our opinion, fulfilled his duties completely; assuming that he has been invited to attend board meetings.

Greens Chairman

We feel the greens chairman of our respective clubs to be our best friend and booster, also liason man between us and the board of directors, if he is not, then the club in some manner should bring about an understanding in this area. This relationship is a must.

We also feel that the greens chairman is one of the most valuable representatives on the board of directors. His wisdom and guidance can either retard or advance the development of the course. The greens chairmanship at a club in our opinion should be one of continuity from three to five years, for continuity in this area can save a club from a great deal of built in expensive headaches.

The greens chairman should meet at least twice a month with the Superintendent to discuss the course and its problems -- Labor -- Machinery -- Maintenance and Construction. This in our opinion, is close relationship at its best.

Club Manager

Next we consider the club manager's relationship to be one of administration. We feel that it is necessary to the best interest of the club to work closely with the manager in this area of administration in order that we can be better informed as

to expenditures relative to our budget. This should be done on a monthly basis. This way we know where we have been and where we can go dollar wise.

The manager is in very close contact with the membership and he hears the complaints or suggestions which ever the case may be. If we superintendents keep him informed as to our operations and problems he can then pass this information on to the respective members, thus eliminating a problem which could be handled as a misunderstanding rather than a complaint.

The Superintendent should keep the manager informed as to his whereabouts at all times. Since we spend 90% of our time on the course and not near the phone it would be wise to keep the manager and the pro informed as an emergency could arise, personal or business, etc.

Most club managers have a tremendous task to perform in keeping the members informed on all matters pertaining to club operations - these include questions and answers pertaining to the course itself, the golf shop, swimming pool, etc. -- keeping him informed will certainly help in bettering relationships.

The Golf Pro

Next in order and most important is the Golf Professional. To most Superintendents he is the showcase of the golf atmosphere of any club. He represents the glamour in this great game by the way he displays himself attire wise, conversation wise, shop wise, etc.

The pro contacts at one time or another during the season the entire golf membership, therefore, what he has to say is of extreme importance to the other department heads, namely; Manager, Superintendent, Chairman and President. He should at no time try to suggest or set policy of any department. He should work very closely with his Superintendent in all matters pertaining to the course, and not intentionally nor accidentally embarrass the Superintendent; for without a good course all phases of a club's operations would suffer. If your Superintendent should by any chance be difficult to understand, call him in and talk to him. If this does not work, talk to the greens chairman, then if still no results ask for a hearing at the board, bring the problem out in the open. However, when going before the board, have a suggestion or better still - have a plan to follow, I am certain if workable, it will be accepted. Fortunately, the above is the exception rather than the rule.

Over the past 25 years I have personally found the golf professionals as a group to be very congenial and understanding of golf problems. I refer particularly to course playing conditions, rather than turf problems. I would like, in closing, to give a composite meaning to each letter in this twelve letter word - Relationship.

- R - Respect for each others position in a club at all times.
- E - Eager to assist rather than to criticize.
- L - Leave policy matters to the department heads and Board of Directors.
- A - Always hear out the Manager, Pro, or Superintendent, side of the story.
- T - Take time out to discuss programming tournaments - etc.
- I - Invite your Superintendent to play a round once in awhile.
- O - Offer constructive criticism rather than just opinions.
- N - Never embarrass your Superintendent, Manager, or Pro, in front of a member.
- S - Select the proper time and place for discussion.
- H - Help each other to educate the golfer in his use of the course.
- I - Insist on closer relationship between the Board and department heads.
- P - Performance in the above suggestions will add a little more flavor to the meaning of this word -----RELATIONSHIP.

THE DAY'S TOPICS - QUESTIONS AND ANSWERS

Fred V. Grau, Agronomist
Hercules Powder Company, College Park, Md.

The concept of CHANGE loomed large in the presentation of every topic. Dr. Cairns pointed out how rapidly we are converting cow acres to play acres, how much more time we have for recreation and how much we need continuing education just to keep pace with the CHANGE all about us.

James Thomas indicated how CHANGE has altered the faces in the crowd, bringing in new ones to replace those who have preceded us to greener fairways.

Al Radko pointed up the CHANGE that has taken place (slowly, to be sure) in grass for fairways. The discussion of pros and cons of Bermudagrass indicates just how drastic the change has been since we stopped trying to grow close-cut bluegrass fairways.

Holman Griffin showed clearly how turf populations CHANGE when growth conditions are unfavorable. Sadly, we do not know all we need to know about how to control those growth conditions. Once we have a good turf, CHANGE is the last thing we want.

The experiences cited by Frank Haske and Bob Shields also indicate that CHANGE is a built-in factor in golf turf. They demonstrated the value of being prepared, flexible, and studious. Experience has been their best teacher.

John Shoulders pointed up several factors. "Soil is the regulator for germination and growth." One might add that soil organisms aid in these regulatory functions. The microclimate deserves understanding; it is so different from "people climate" 4 to 6 feet above the soil. A good putting green soil in Virginia contains 50-60% coarse to medium sands, 10-15 clay and 10-15% organic matter with some silt in addition. Each soil type has its own characteristics. Nothing takes the place of uniform, off-site mixing. Topdressing should be identical to soil in the green.

Dr. James Miller's Figures on housing, sod growing and turf growth in general were impressive. They speak eloquently of the CHANGE that is in progress. His review of lime and fertilizer left little to be desired. Intriguing were the explanation of magnetic "love affairs" in the soil. The explanation of "burning" was helpful, also to be reminded that some materials such as natural organics and urea-forms do not burn. Maryland is rich in limestones, a valuable ally in growing turf. Dr. Miller's pictures of soil testing at the University of Maryland create further confidence in this department of the University.

Bob Miller pointed out how reputable companies constantly strive to improve a "technically-perfect" product but, "the product is not made that cannot be ruined by mismanagement." The review of fungicides and management programs was most helpful, filled in with philosophical side notes.

Tom Doerer's approach to Relationships was down-to-earth commonsense. His message deserves to be read by the many who were not at the meeting. Jacques Aim delivered a stirring message in his own inimitable manner. His approach to understanding and cooperation is the "people-to-people" touch. He sees the successful club employee as one who creates beauty in nature and in his personal dealings, and who thinks of the entire organization. Humor and integrity will save many a situation with your fellow man.

In being permitted to distil the thinking of the several speakers who appeared on Monday, I must say that I am impressed by the clarity of thought and the perfect-

ion of delivery of each and every speaker. The CHANGE that has taken place in the 35 years of the University of Maryland's Turfgrass Conferences constantly has been in the direction of higher standards and higher quality. Increased effort will be required to maintain the peace.

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LABOR RELATIONS

James E. Thomas
Army-Navy Country Club, Arlington, Va.

This paper is directed at Labor Relationships as they effect our distribution of work, and as to how we can use employees to the best advantage. Also, we might add to this subject the planning and scheduling of our daily duties, and how management practices can have a direct bearing in our public relations with those whom we strive to please.

Additional free leisure time as provided by extended daylight savings and newly developed high speed freeways, has paved the way for more recreational time. Swimming, baseball, golf, tennis, etc. have all benefited from these extra moments of relaxation. Golf has particularly been helped by the television coverage of both national and sectional tournaments and events. The enthusiasm for the pastime by prominent citizens who are in the public eye has played its part--a typical example is ex-President Eisenhower. All of these contributions have brought about a new and very marked interest to golf.

This greater participation by the public, along with its added activity has greatly increased the responsibilities of the golf course superintendent. He is not only faced with the problem of keeping his members happy and contented, but, also the golf course must be kept in tip-top shape, as the membership expect it to be in the pink of condition at all times - regardless of the weather or season of the year. So many of the chores necessary for the development, establishment, and maintenance of a satisfactory turf interferes somewhat with play. This holds true in the grooming of trees, putting greens, and sand traps.

Such being the case, our dyed in the wool golfer asks us this question - "Why interfere with our golf?" We in turn ask ourselves - Why does he interfere with our work, or why are we not provided with the needed time to accomplish our tasks? However, this is the wrong attitude for us to take, as golfers are our employers and we look to them for our bread and butter. Yet, proper upkeep must take place or there will be no golf course to play on. This brings up the question of "How and When?" We have here an ever growing problem, one that becomes more complex each season, and is a puzzling sixty-four dollar question for many of us to try and solve.

Mr. James L. Holmes of the USGA Green Section has this to say: "It is becoming increasingly more apparent that the Club must allow its superintendent more uninterrupted time in order to complete his work if they expect him to give them a presentable course. This increase in traffic is reaching alarming proportions. Many Clubs are now closing the course to all play on Mondays, as an example."

Here and there we hear of night maintenance being tried as a solution to the problem. All operations such as the mowing of tees, fairways, and greens; and the irrigation of those areas, along with the application of fungicides and insecticides are all done after dark. However, this has its drawbacks and presents obstacles for the greensmaster to hurdle, as a night crew of workmen will be needed, and they must be organized and provided with adequate and trained supervision.

The satisfactory accomplishment of after dark work would call for the provision of artificial lighting. Heavy dews would bring about wet grass and when it was

mowed the clippings would bunch up in unsightly piles, and would have to be removed or scattered. A major objection to night maintenance would be increased costs, an added drain on the club's pocketbook. Yet, as play increases the price tag of upkeep becomes greater. It may be hidden, but never the less, it is there.

Another answer, an old one, but practiced at many places, is the starting of all work at daybreak during the peak of the heavy playing season. This could be from 4 a. m. until about 1 p. m. And if clubs could be encouraged to withhold the starting of play until 8:30 a. m. of a weekday morning many of our important chores around the putting greens like: mowing, watering, changing of cups, repairing of ball holes, and the raking of sand traps could be accomplished and out of the way before play gets too heavy. The closing of courses to play on Mondays would also be a big help, as it would allow the uninterrupted aerifying, spiking, top dressing, and weeding.

For any of the previously mentioned procedures to work to the best advantage sufficient equipment in good working order must be provided. The more we can streamline our work comparable to a mass production basis, the greater our efficiency becomes.

Today's labor market is a difficult and tight one; good help is scarce and hard to hire. The continued boom in construction and building has caused workers to be in short supply. When our helpers are satisfactory to us, we need to do everything in our power to keep them happy, contented, and employed. A few of the ways to do this are: the providing of a satisfactory wage scale, year around employment for as many of our workmen as is possible; the establishment of fringe benefits like, group hospitalization, sick leave, paid vacations, retirement annuities, and life insurance. Remember, we are competing with employers who provide such rewards, and experience has shown that these extras help to keep a working crew intact and secure.

No two courses present the same maintenance problems, each one is a case in itself. There are differences in soils, terrain, maintenance requirements, and possibly the most important, the type of course demanded by the membership. A study of the information obtainable from available surveys leads one to make several observations: 1. Labor is one of the major items of expense in golf course maintenance. 2. Labor costs are gradually rising. 3. The management of manpower for its most effective use is assuming increasing importance.

So, how do we increase our efficiency? Someone has said: Labor management might be properly grouped with work planning and business management. That the most logical place to control golf course costs is by increasing the efficiency of labor utilization. Here normal business principles, plus good management, along with the proper handling of technical problems can be used to good advantage with still plenty of room left for improvement.

So - with the cost of golf course operations continually spiraling upwards and, the golf public expecting and demanding the ultimate in course grooming, and this being confirmed by every reliable source of available information. We cannot help but assume that labor is the largest appearing cost item in the operating budget, that it exceeds in most cases the sum total of all the other budget categories. Then obviously the mark of a top superintendent is one who can accomplish maximum results with a minimum work force.

The use of golf course labor to the best advantage requires yearly, seasonal, monthly, weekly, and daily planning of work schedules. Yearly planning calls for the arranging and timing of all of the season's activities; the proper correlation of the year's performances. This means doing the right job at the proper time. A good illustration is not to undertake construction jobs when regular and routine maintenance should be the order of the day. Seasonal planning is secondary to annual planning, and means the keeping of winter, spring, summer, and autumn work in its

respective place. Monthly and weekly planning is more or less governed by the season of the year we are in. Daily planning covers the actual maintenance that must take place, quite often it can be an unknown quantity governed by the number of workmen on hand, variations in the weather, the amount of play, ladies days, and unforeseen situations.

How can we train workers to do the job we desire to have accomplished? As an answer to this question, I am going to quote from a talk made by a former Army Navy Country Club Green Committee Chairman, Admiral John S. Phillips. He is known to most of those present. Quote, "It is incumbent on superintendents to give rigorous technical and, in a way, moral training to crewmen. In your position as superintendent, always feel that it is much better to train a man to be reliable, honest, and trustworthy than it is to fire him. Firing a man does not require much know how. A well rounded crew is the mark of a good superintendent, because most of the training comes from the superintendent. Oftentimes, a good man is fired because his training has been neglected by the man who oversees him. One thought to consider is that if you spend five hours telling a man how to do a job and one hour telling him why he is doing it, you will make a better workman out of him than if you devote six hours telling him only what do do."

We need to study our helpers, analyze them, find out their best qualifications and aptitudes. By doing this we can place them on jobs best suited to their qualifications, work they will take an interest in, and pride in doing to the best of their ability. In short, let's place square pegs in square holes, and round pegs in round holes, taking care not to mix them up. Our management policies should be patterns of assistance, rather than those of dominance. We need to fully understand the meaning of proper guidance, along with reasonable toleration and understanding. Yet, we should be firm in our instructions and requirements; but, not overbearing and too demanding. Do not fail to give credit for a job well done when it is due. All of us appreciate an occasional word of praise and a commendation of appreciation when it is sincere and has been honestly earned.

As a closing summary: Let's study ourselves, our positions, our assistants, and our clubs with the thought uppermost in our minds of creating a higher standard of efficiency. Let's encourage and help our crew members to be worthy of their hire, and train them to become better employees. And, above all things let's practice and Golden Rule - "Do unto others as you would have them do unto you."

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TURFGRASS RESEARCH AT BELTSVILLE

Felix V. Juska
Agricultural Research Service, U.S.D.A., Beltsville, Md.

The Mid-Atlantic area including Beltsville, is located in the so called "transition zone" of grass adaptation. Neither cold season grasses or warm season grasses perform entirely satisfactory. The cool season grasses are more susceptible to diseases and are not well adapted to our hot, humid summers. Your experiences with these grasses I am sure will bear me out. The warm season grasses, Bermuda and zoysia grasses on the other hand, perform satisfactory during the summer months, but become green late in the spring and become dormant too early in the fall. The Bermuda grasses such as U-3 also lack the winter hardiness we would like to have in this species.

From the standpoint of turfgrass research, I feel Beltsville is ideally located. In general, grasses which perform well to the north or south of the Mid-Atlantic region are not well adapted. It is necessary for the individual to use

his own ingenuity gained from experience and research to grow and maintain a satisfactory turf. Perhaps our greatest need in this area is for new varieties of three or four species which will thrive under our weather conditions.

Research at Beltsville may be conveniently divided into four categories:

1. Grass breeding:

- a) Bluegrass - resistance to Helminthosporium leafspot disease and other turf desirable characteristics.
- b) Red fescue - disease resistance and rate of underground spread.
- c) Tall fescue - rhizomatous habit of growth
- d) Zoysia - Retention of fall color and early spring greenup.
- e) Bermudagrasses - more winter hardiness.
- f) Evaluation of blue, bent, zoysia, fescue and bermudagrasses.

2. Management studies:

- a) Nitrogen fertility - rate and time of application.
- b) Evaluation of foreign seed lots.
- c) Bluegrass variety and height of cutting studies.
- d) Shade tolerance of bent and red fescue.
- e) Management of tall fescue.
- f) Phosphorus studies.
- g) Calcine clay as a soil amendment.

3. Fungicide trials:

- a) Use of several fungicides with and without latex for disease control.
- b) Use of latex and fungicides to control bentgrass wilt.

4. Weed control:

- a) Crabgrass preemergence studies.
- b) Toxicity of preemergence herbicides to grass seedlings.
- c) Control of other weeds - dicamba (Bonvel D).

Perhaps, I can best illustrate the work we are doing with the use of the following slides.

(Slides)

GOLF COURSE MAINTENANCE AND TRAFFIC PROBLEMS

Lee C. Dieter
Washingtonian Golf and Country Club, Arlington, Va.

To give a fairly accurate picture of how the golf boom of the 60's has affected the golf activity in the Washington area, I conducted a survey of 19 of the private clubs in the metropolitan area. The clubs concerned are all strictly private. The number of private clubs has increased from approximately twenty 10 years ago to approximately 35 at the present time. These figures include 9 and 18 hole additions to present facilities. The average club in this area reports an increase in play of 10% to 20% in the past 5 years. This is the average. The figures show increases of as much as 50%. What does this represent in terms of actual rounds of golf, and how do these figures compare with the rest of the country? In the October issue of *Golfdom* the following figures were reported. They are on private clubs throughout the nation. Compare these to the figures from my survey. Mid-Atlantic 5 years ago 29,090, Mid-Atlantic today 33,766; New England and the East 21,200; Midwest 23,850; South and Southwest 29,622; West 23,900.

New golf carts have entered into the turf picture. How do they enter into the traffic picture? Actually they do little to speed up play unless, of course, everyone is required to take a cart. Play still moves around the course little faster than the slowest foursome. On the 19 courses included in the survey there are 293 golf carts, an average of 15.5 per course. They account for an average of 4,328 rounds of golf. The number of golf courses that have zero carts is 2; the number that have 1 to 10 is four. Four clubs have 11 to 15 golf carts. Six have 16 to 20, two have 20 to 30 and one has over 30.

On these courses cart damage is becoming an increasing problem. All courses that have carts realize that there are places where they must have paths. Those that don't already have cart paths have plans for them in the near future. Cart facilities, buildings, paths, etc. are needed at the beginning. With the carts comes the need for increased maintenance, sodding, seeding aerification, etc.

In considering the large capital outlays for paths and housing facilities, most clubs in this area have, in setting up their cart program, included an amount set aside from the golf cart income to finance the increased operating costs. These amounts range from \$100.00 per cart per year or about 10%, to 25% of the gross cart income. The trend in the survey seemed to be toward professionally owned carts with the club getting 10% of the gross to be applied toward the increased maintenance and the cost of paths and cart facilities.

Several years before I started at the club, a major construction program was undertaken to rid the course of some of its bottlenecks. The program served its purpose and got rid of several areas that helped Washington Golf & Country Club earn its nickname of the "goat path golf course." With the planned introduction of golf carts three years ago, we realized that before we could even have carts several bridges and paths would have to be built. That certain hills and creeks would be impassable unless corrective measures were taken. The first six paths were built and carts were introduced; we knew more paths would be needed, but we decided to construct them as traffic made the wear evident. In the past two years 12 more paths have been added.

We realized that our poa annua fairways were not ideally suited for foot traffic in our area, and that our thinning turf would suffer even more with the increased traffic of golf carts. We decided to go into a program of establishment of highbred Bermuda grass fairways. Nurseries of 328 and U3 Bermuda were established. We bought a machine and adapted it to plant the stolons. The first year, 1961, over

1/3 of the fairway area was sprigged. We planted half the fairways to U3 and half to 328. The early summer of 1962 raised our enthusiasm, the Bermuda was coming in wonderfully, responding to frequent applications of ammonium nitrate. In fact, each strip across the fairway was one solid unbroken line from 4 to 8 inches wide by mid-summer. We went forward with enthusiasm on our sprigging program in 1962, introducing the Bermuda to another 30% of our fairway area. By late summer of 62 over 2/3 of our fairways were planted to Bermuda, primarily 328. Then came the winter of 62-63 with its weeks of sub-freezing temperatures.

Came the spring and we all waited for the first glimpse of growth. Several of the native strains on the course greened up slightly, but where was the 328 and U3? It was the first of July before the hybrid strains started to show much growth. Our fears were confirmed, the material planted the previous summer was virtually wiped out while the areas that had two growing seasons did not fare so badly. We were discouraged by this severe desiccation but were not ready, by any means, to give up on our program.

The nursery has been established with selections of native Bermuda grasses from our course, several outstanding Kansas selections, and our own area's Burning Tree Bermuda.

To help diminish the effects of the increased traffic on our course we have stepped up our maintenance program considerably. We have increased our fertilization rates. The mechanical soil conditioning of our turf areas has been increased. All greens, tees, aprons and fairways receive at least two aerifications during the growing season and as many as 6 or 7 on some greens and concentrated traffic areas. We prefer the cultivating action of the spoon type aerifier to the action of the puncher type.

At Washington Golf we have the narrowest fairways and the smallest greens and tees of anyone in the metropolitan area. Yet, in the past five years, we have experienced an increase in rounds of golf of almost 20%. The figures seem to be leveling off at about 36,000 rounds. The cart rounds have increased at the rate of 1 1/2% per year since their introduction three years ago.

Our paths and bridges have helped to route this increased traffic and have taken some of the burden off our areas of concentrated traffic. We found, however, that it was necessary to go even further in traffic directions. A non-alkaline dry marking material is used to mark all aprons and other areas where cart traffic is not allowed. We have found this very effective in controlling traffic.

We try to keep golfers, and especially the golf carts off the course when conditions are exceptionally wet. We also try to be careful with our equipment traffic. In areas where our equipment can use the paths as well as the golf carts, they have been made 9 feet wide to accommodate them.

Operations are combined as much as possible to reduce vehicle traffic. The size of the load is regulated to soil moisture conditions to eliminate the compaction and tracks as much as possible.

I would like to say in closing, gentlemen, that we can only take advantage of the tools and knowledge presently available to us to help ease the effects of this increased traffic problem. There is little we can do to stop it. The number and the interest of these golfers shows no limits.

CONSIDERATIONS IN THE LANDSCAPING OF GOLF COURSES

Carl N. Johnson

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The importance of golf courses, both private and public, for recreational purposes is taken for granted. We can hope that in the near and continuous future, more and more land will be set aside for this purpose, as a balance against ever-encroaching housing developments. Aside from their recreational importance, golf courses are important as open land masses which afford man a relief from the monotony of traffic arteries and uninspiring rows of houses in typical suburbia. Studying the landscaping of golf courses from this standpoint then, it would seem imperative that the landscape would have to be as natural as possible, as park-like as possible. This would preclude such "unnatural" forms as severely clipped or sheared hedges, upright evergreens or any forms that might be labeled "stylized". Planting distances should be maintained that will allow specimen material to grow to mature size without crowding and without the necessity of future pruning.

Many things in Nature please us because of their inherent characteristics. We may be pleased by color, especially the contrast and blending of many shades of green. We may also be pleased by contrasts in texture, by shapes and masses. In adapting these characteristics for landscape use, we may group them into simple categories, analyzing their qualities and how we may use them effectively. The following paragraphs will consider eight categories that we are most concerned with.

Lawn Areas

We are concerned here, not so much with the condition of greens, tees and fairways but of the lawn areas immediately adjacent to the club house. It is sometimes difficult to maintain this area unless adequate walks and paths are provided to direct foot and cart traffic. Walks should be wide enough to accommodate two people walking abreast, either carrying bags or using a cart. If possible, all walks should be hard-topped. Generous areas of paving may also be desirable at places where people tend to congregate.

Tree Masses

Tree masses are used, of course, to enclose and to divide fairways. Upright branching habits are preferable to horizontal, low branching species. Natural grouping is important since straight-line plantings would appear artificial. Some openness is also important to allow for filtered sunlight. The effect of a "glade" should be attempted, rather than a dense forest.

Shrub Masses

These would be used mainly around the club house to provide colorful bloom in spring and also for fall coloring. Hardy species are preferable, especially in exposed locations and those species should be chosen that will require the least amount of maintenance.

Evergreen Masses

Especially valuable for color in early Spring and late Fall when most deciduous trees are without leaves. Pine species are probably more adaptable for golf course use than Spruce or Fir, since lower branches can be trimmed up without adverse effect on the shape of the tree.

Upright Types

Strictly pyramidal types of evergreens are useful as accents, either singly or in informal groupings. They may be used as boundary plantings or to crown a hilltop and as a backstop for a green. They also add variety to the landscape since they contrast to the more rounded forms of other plant materials. Since, however, they are highly individualistic in character, they should be used sparingly. Our native Cedar is an excellent example of the pyramidal form.

Weeping Types

This is a form which is pleasing to the eye because of the graceful cascading of branches. Again it is useful as a contrast to upright branching forms of most of our deciduous trees. And again, since it is as highly individualistic in character as the upright type, it should be used sparingly, and only where it can be used most effectively. The Weeping Willow and the Weeping Birch are the most common examples.

Color

Color is most obvious in Spring when most of our flowering trees come into bloom, but color can be worked into the landscape at other seasons as well. In very early Spring, the light green of the Willow and the red catkins of the Swamp Maple give the first promise of color. Red, orange, yellow and bronze are predominant in the Fall. The brilliance of these, used in masses especially mixed with or set against evergreens, can create a spectacular effect.

Features

The introduction of landscape features, especially around the club house area, can create special interest. These might consist of earth mounds in very flat areas, paved areas on which flower planters can be spaced, unusual plant material, outdoor eating facilities, water (other than that used for hazards), or areas of ground covers to relieve the monotony of grass.

Conclusion: Though superintendents of private golf courses, you may also consider yourselves superintendents of public assets, a point of considerable importance for the present and especially for the future.

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HOW TO BUY SEED

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The quality of grass seed is extremely variable. Today's golf course superintendent must be aware of these variations in quality and must know how to buy the best possible turf grass seed. He must demand that extra high quality seed at almost any cost since the cost of seed is one of the smallest items in his overall budget. I am passing around two sets of samples of Kentucky Bluegrass. One is marked A and the second B. Take a look at these samples. Decide which one you would buy and pass them on.

Seed offered for sale in Maryland or in any of the Mid-Atlantic States comes under the regulation of the State and Federal Seed Laws. Neither can be any better than the state enforcement Agency. Seed moving withⁱⁿ the State comes under the jurisdiction of the State Seed Law, whereas seed moving in interstate is covered by the Federal seed law. However, the state officials locate lots of seed in violation of the Federal Seed Act. The important item concerned is the labeling.

What is required by most states and the Federal Seed Law in the labeling? Let us look at this economy size tag. First we have the kind of crop and the variety names.- Merion Kentucky bluegrass and Pennlawn Red Fescue. Second, we must have somewhere on the label a lot number to identify the seed. Third, we must have an analysis which shows:

- Pure Seed
- Other Crop Seed
- Inert Matter
- Weed Seed
- Origin if known
- Germination - 9 months for most state laws
5 months for the Federal seed law.

Name and number of noxious weed per ounce in the case of most grass and legume seed but per pound in some grain.

To you as golf course superintendents some crop seed may be as objectionable as noxious weed. Take annual bluegrass timothy, or orchardgrass in Kentucky Bluegrass. Don't all of you want some of this on your course?

One other item on the tags is the tagger.

Most people will go to the seed store or you might even call them on the phone and tell them to deliver so many pounds of Bluegrass seed. You are relying on the reputation of your supplier. Let me show you the analysis tags found less than a year ago on seed being handled by a reputable seed dealer in Maryland.

Show two tags. (note origin and germination. Also crop and inert and weed in Poa Trivialis). This seed was accurately labeled and as far as either seed law was concerned they could not legally touch it. You as a buyer were responsible to read the label and decide whether this is what you wanted. Here is my first point:--

READ THE LABEL.

To help you avoid a situation wherein you would order seed and have such seed as the above delivered you should buy seed on specification. These need not be complicated like Government Contracts, but in general they should spell out what you desire. Let's take an example. If you want 1000 lbs. of Kentucky Bluegrass specify 1000 lbs. of Kentucky Bluegrass and not 10 bags which you hope will have 100 lbs. each.

- | | |
|-------------------------|--|
| Minimum pure seed | No Noxious Weed |
| Maximum other crop seed | Free of Poa Annua, Orchardgrass, Chickweed, etc. |
| Maximum weed seed | U.S.A. Origin |
| Minimum Germination | |

This is the second point I would like to make with you. Buy your seed on specification. You write these out or at least have them definitely in mind if you want to buy fertilizer, truck or a tractor. Why not do it with your seed for these should outlast any of the above items and your business is really dependent upon the grass. Personally, I would like to see you buying seed on the pure line seed basis. Let us look at the analysis of seed tested for a few crops in 1962-63.

	<u>Pure Seed</u>	<u>Crop</u>	<u>Inert</u>	<u>Weed</u>	<u>Germination</u>
Kentucky Bluegrass	98.68 - 73.12	7.08 - 0.0	26.88 - 1.10	2.21	98.60 - 61.00
Merion Ky. Bluegrass	97.71 - 84.25	4.37 - 0.0	11.08 - 1.56	.87	86.00 - 59.00
Red Fescue	99.90 - 94.54	1.52 - 0.0	5.29 - 0.00	1.73	98.00 - 59.00

Let us look at a few examples of the Kentucky Bluegrass. Now would you rather buy the 98.68 Pure Seed with germination of 98% or the 73.12 Pure seed with 61% germination?

<u>98.68</u> <u>.98%</u> <u>78944</u> <u>88812</u> 96.7064	<u>73.12</u> <u>61%</u> <u>7312</u> <u>43872</u> 44.6032
(cost equals .537¢ per lb.)	(cost equals \$1.03 per lb.)

Next do you realize a testing facility is available to test seeds for you? The State Seed Laboratory at College Park is happy to test any seed for you. It is a good practice to draw a small sample of the seed when it arrives and submit it to the Seed Laboratory for purity analysis, germination and noxious weed examination. This is a safeguard. You test your soil to tell how much fertilizer you should add. The Seed Laboratory officials are happy to aid in this quality control program. You may want to pay for the seed on the basis of such a test. Spell this out in the purchase order.

Lets look at a few reports on grass seed tested in 1963 at the State Laboratory.

Some of you will be using vegetative material for planting the greens or even the fairways and tees. Here I wish to advise you to buy certified sprigs when possible and to buy from a reputable supplier. Through certified seed you are assured of getting seed stocks true to variety and usually of superior quality.

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OUR PUBLIC RELATIONS

Dr. Edward W. Aiton, Dir.
Extension Service, University of Maryland

Because my approach to the subject of "public relations" is a little unorthodox, permit me to give a definition of public relations as I believe we should look at them. Good public relations is "having a good program (a good golf course, a good annual meeting, a good church service, a good automobile or a good anything else) and getting credit for it."

This concept rejects such notions as "how to win friends and influence people" (whether or not they want to be won and influenced.) It denies that obsolescence of one's product is a worthy objective of an engineering design or a merchandising plan. It even resists the use of gimmicks or hidden persuaders, exploitative tactics and taking advantage of customers for personal gain. In my opinion, such manipulation of human dignity is neither desirable nor productive in the long run. I believe with President Lincoln that "you can fool some of the people some of the time, and you can fool all of the people some of the time, but you cannot fool all of the people all of the time."

Taking the two parts of this definition--having a good program and getting credit for it--let's look at your first responsibility. For a golf course superintendent, having a good program means a good golf course; it means creating and maintaining that golf course from the viewpoint of customer or your clientele, not necessarily from the way you or I would approach the subject. Your customer will be happy if your golf course provides him with open space, beautiful surroundings, a course that is challenging and one which has all of the earmarks of good craftsmanship, good design and architectural acumen. He will enjoy a course where his good talents will be rewarded with a good score; and if he doesn't have a good talent, he may still enjoy the atmosphere, the surroundings and the original purpose of golf. Even in such a setting he may not become a successful golfer, but he can be a satisfied customer and a happy American.

Your conference program this week is jewel-studded with suggestions for having a good golf course. It is obvious that you men are serious about your business. You wish to do a professional and a scientific job of landscape gardening. The list of topics on your program is mute testimony of this, so I shall not belabor that aspect of your task in this talk.

What about the second aspect of the subject? How do you get credit for a good golf course? Well first of all, your customers will be appreciative, your pro will be appreciative, your Board of Directors will be appreciative and your staff will be appreciative of the opportunity of sharing with you the satisfaction of belonging to a good association. Everybody wants to be proud of his own outfit! This, in itself, is perhaps credit enough, but there is more. You can encourage and stimulate an appreciation of your good golf course with several little devices.

What are your customers doing while they are waiting to tee off, or to let that rain shower pass over? Do you provide them with a little fact sheet--a little bulletin of some kind which gives them more information about the marvels of your beautiful course? Recently I picked up a copy of "Table Talk" the chatter-box type of news letter which is put out by the Hot Shoppes' organization. It is chock-full of tidbits of human interest value to their customers. Another example of this is the "C. & P. Call." It is a small booklet which describes our telephone system, its services to the public, some of their problems of operation; but most of all, it tells the story about how the telephone is serving its customers.

You have marvelous opportunities for a little publication like "Tee Talk".

Can't you just visualize a paragraph or two on each of the following topics:

- "What You Don't See on a Golf Course! (besides girls in shorts)
- "What's Holding You Up? (miracles of soil biology and structure)
- "Rough Talk" (jokes)
- "Bill and Coo" (birds you may see at _____)
- "About Our Par 78---" or "Is #7 Trap Too Deep?"

Give your patrons some knowledge or thunder and they will spread the good word about your business faster than you could ever get them to read it in the sport pages. And remember, Durante was right--"Everybody wants to get into the act"--even your act.

Finally, if you would have your efforts appreciated, you must first appreciate your own staff, your own boss, your own customers and see their side of whatever picture you're trying to sell. "Love thy neighbor as thyself" is more than a good scripture lesson for Sunday mornings. It applies in the hard, cold world of economics too. And remember that Bobby Burns said, "see yourself as others see you. Get close to your customers and your bosses by finding out their interests and catering to these. Public relations is human relations, and good inter-personal human relations depend more on you than they do on the other guy.

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THE CLUB MANAGER AND THE GOLF COURSE SUPERINTENDENT THEIR RELATIONSHIP TO EACH OTHER

Jacques Aimi, Manager
Woodmont Country Club, Rockville, Md.

Last October at the Golf Course Superintendents' meeting at Woodmont Country Club, your distinguished President, Mr. James Thomas, asked me if I would like to speak to your organization. Boldly, I said, "Yes, I will be very happy and honored to do so," but deep in my heart I was scared. What could I talk about? However, Mr. Thomas assured me there is much that can be said regarding good relationship between Golf Course Superintendents and Club Managers, and he is certainly right in more ways than one.

A club manager is constantly in the eyes of the members and is subject to most of the complaints. These complaints may not have been made to anyone else and unless the manager does something about them, they remain just complaints. For instance, last summer we had a bad time for fairways. Many members came to my office and said, "Mr. Aimi, when are we going to do something about our fairways? Look at other clubs in this area. Their fairways are in much better shape and yet we spend so very much money to improve ours." It was the old story...the grass always looking greener behind the other fellow's fence. I went to our very capable Golf Course Superintendent, Bob Shields, who is your well-known Vice President, and Bob graciously took me around the Woodmont Golf Course....and explained the problem. Bob said, "Mr. Aimi, all that you see on these fairways is alive but it takes time to grow. With every step we take we are walking on something that is living and breathing. You can help Nature, but you cannot speed it up as much as you want. Growing takes time."

From then on when a member complained about the fairways I could give him a reasonable and satisfactory answer, thanks to Bob's explanation, and the complaint was not repeated. Every manager owes it to the Golf Course Superintendent and to the members to try to understand reasons and give the right answers....and the golf Course Superintendent owes it to the manager to anticipate complaints and explain the causes. Being a jump ahead makes for a more pleasant relationship for all concerned.

A Golf Course Superintendent in any Country Club holds a very important position. It is the duty of the Club Manager to uphold that importance to the members. The manager should be familiar with any real problems on the golf course and take the time to consult with the Golf Course Superintendent and get the facts. It never hurts to ask questions for in this day and age there is no such thing as Superman. Nobody has all the answers and to get even a few it takes consideration and understanding. I repeat, to always think of the other person and his problems...to try to understand them and help him understand yours. It makes for a far better relationship between all departments.

I make it my business to see that I know all the names of persons working on the greens as well as something about their families. When I talk with the workers, it pleases them to think I have taken the extra interest and add the personal touch. We all like to feel that someone cares and speaks with kindness and understanding. It is amazing what far-reaching results this can have. When talking to a member of the Maintenance Crew, it doesn't hurt to ask, especially on a very cold day, "Are you comfortable in your home? Is there anything I can do? Are your children warm? In doing such a simple thing as that it helps to make the work of the Golf Course Superintendent easier, for there is a greater loyalty established between head and crew.

Every club manager should have lunch occasionally with the Superintendent and keep up-to-date with the progress being made on the golf course...for after all, who can be a better spokesman for him than the manager. There is so much to be said in every direction, now that I'm started, I could go on for hours...but I won't.

Each December at Woodmont Country Club we have a Christmas party for the staff... to honor them and their wives or husbands. We have a lovely buffet and an open bar. Every employee of the Club is invited and I act as host. The Club President and the various chairmen attend...the President talks and thanks everyone for his part in making the club operation successful. For some of the employees this is the one and only time in the year that they come inside the club house and it means a lot to them. I'd like to tell you of one thing that happened at one of our Christmas parties. I was at the front door to greet the maintenance crew members and their wives. One lady, the wife of one of the key employees on the greens, said to me, "Mr. Aimi, this is wonderful! My husband has worked at this club for 12 years and this is the first time I have ever been in the clubhouse." Gentlemen, I felt about THIS high. I looked at myself in the mirror and couldn't even see myself. This mere VISIT to the clubhouse meant so much to this lady!...and yet, in twelve years no one had been considerate enough to even think of it. This proves that we can all make mistakes... and that goodwill can be created through what might seem to some - very little things

Now let's take a look in another direction. One very big phase of any Golf Course Superintendent's work is to create beauty when landscaping the Golf Course... the Club entrance...the grounds around the clubhouse. Whether anyone realizes it or not, beauty of surroundings adds much to anyone's personal happiness. It is the constant job of both the Manager and the Golf Course Superintendent to do everything possible toward that end. After all, the motto of every club should be one to please the members and make them happy. Every Golf Course Superintendent is an artist in his own way and to create beauty is his privilege.

It is so extremely important...and so many, many times completely forgotten... that everyone connected with a club should at all times FEEL AND KNOW that the interest of the club as a WHOLE SHOULD COME FIRST. You remember the wonderful words of our late beloved President, John F. Kennedy...ASK NOT WHAT YOUR COUNTRY CAN DO FOR YOU BUT WHAT YOU CAN DO FOR YOUR COUNTRY. The same idea applies to all phases of club life. It is not what your club can do for you, but what you can do for your club. A Golf Course Superintendent is like a king in his own department and if he is a wise king, he thinks in terms of the welfare of his men...and also, if he can instill in his men by words and example that the CLUB COMES FIRST, I guarantee you, my friends, he can hold his head very high and be assured of success.

Between the Golf Course Superintendent and the Club Manager there must be mutual respect. Sometimes a Golf Course Superintendent has held his position for many years when a new club manager arrived...or it might be the other way around. Regardless of any difference in age or time of service, in this world every man has something to give to every other man. Everyone can learn something from everyone else. Mutual respect goes a long way toward harmony and success. Remember what Will Rogers used to say - "I never met a man I didn't like". If we had Will's philosophy, maybe all of our jobs would be easier.

No club manager worth his salt ever wants to take any authority away from a Golf Course Superintendent, or interfere with any policy established, providing that some authority is wisely used and the policy in operation benefits the club as a whole. We must keep in mind that we are living in an age of speed and what might have been good last year, today may be completely out of date. We all have to be on our toes constantly, whether we like it or not.

I am European born. I have worked in France, Italy, Spain, Belgium, England, South America...and I have observed that no matter where in this world one works, the person who succeeds thinks in terms of the entire organization and not in just a particular department. The person who is not willing to help wherever and whenever possible...or has the attitude, "I was not hired to do this or that...or, "Who cares? It's not skin off of my back"...never goes to the top of the ladder.

The relationship between the Club Manager and the Golf Course Superintendent.... as well as the relationship between the Golf Course Superintendent and the maintenance crew, should at all times be one of fairness and justice with the final goal.... the happiness of the members which means the success of the club....always in mind. And believe me, a sense of human helps. How many times you must have seen a grin or a friendly pat on the back...or a joke...or a kidding remark break the worst tension. If I were a doctor, I would recommend a sense of humor as the best cure for all ills.

This crazy world slowly but surely is beginning to realize that we all need each other and that we MUST work together. I leave you with one thought.... INTEGRITY IN OUR EVERY DAY WORK....INTEGRITY IN OUR EVERY DAY RELATIONSHIP WITH OUR FELLOW MAN....it is the greatest asset any man can have....now or ever.

Thank you very much for the privilege of speaking with you.