UNITED STATES GOLF ASSOCIATION
GREEN SECTION
WESTERN OFFICE

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• Western Turfletter •

R E S E A R C H -- Our Most Important Product

From that first day of American Golf (in 1888) on a "cow pasture" in Yonkers, New York, Superintendents have been burdened with poor soils and hobbled by compaction in putting greens. Through the years, finding the right soil mixture has been largely a matter of "hit and miss" - and we have missed painfully often.

Our troubles have increased in recent years. From 10,000 to 12,000 rounds of golf a month is not uncommon for many Western courses. Superintendents battle shallow roots, thin turf and Poa annua. This month, relief through published research comes into view.

Dr. O. R. Lunt, Department of Irrigation and Soils, UCLA, reports on his work to determine - "A Method for Minimizing Compaction in Putting Greens." The July 1956 issue of "The Southern California Turf Culture Bulletin" contains this basic research information that may well have far reaching effects. Another compaction study, supported by USGA Green Section Funds, has been conducted by Mr. R. Kunze, at Texas A. & M. Both Dr. Lunt's and Mr. Kunze's work will soon receive wide publicity. Here, we report only a portion of Dr. Lunt's work:

"The soil property which probably has the greatest effect on plant growth in putting greens is its capacity to permit gas exchange with the atmosphere. Sand layers in greens, compaction and destruction of large soil pore spaces, coupled with frequent irrigations, combine to produce soils that are nearly saturated with water and devoid of air.

"All recent studies are in general agreement. Satisfactory infiltration and drainage will occur in putting greens if the soil mix is sufficiently high in sand. In all probability, 85% sand will maintain high infiltration rates, provided particle size distribution is right.

"If 85% to 90% of the soil mix is composed of sand, the remaining 10% to 15% of the mix should be composed of fibrous peat and well aggregated clay. In laboratory tests, soil columns composed of 85% sand (0.42 - 0.21 mm in size), 7.5 Krilium treated clay and 7.5% peat by volume have maintained infiltration rates in excess of one inch per hour after having received a compaction treatment.

"The 85% - 90% sand, 5 - 7.5% Krilium treated clay, and 5 - 7.5% peat, may be obtained by mixing 10 parts of sand, 2 parts of sandy clay loam, and 3 parts of loose peat. This mixture, when it settles, yields about 13 volume units rather than the 15 which went into it.

Dr. Lunt answers four (4) essential questions in his paper:

(1) "How thick need a sand layer be?"

ANSWER: These data indicate that a 4 inch layer of sandy mix on top of a soil susceptible to compaction will protect the soil. Somewhat deeper layers are desirable if available materials and construction costs permit.

(EDITOR'S NOTE: A minimum of 8 inches is suggested for proper cup changes).

(2) "What size sand is desirable?"

ANSWER: 75% sand in the range of 0.4 to 0.2 mm; 6 - 10% in the range smaller than 0.10 mm; not more than 2% silt or clay. Very fine sands, 0.10 to 0.05 mm. may very well seal up if unaggregated silt or clay is present.

(3) "What should the other constituents in the soil mix be?"

ANSWER: A desirable amount of clay appears to be about 7.5% or less. Mr. Kunze suggests blending in a small amount of Krilium clay into sand mixes. This increases, slightly, the capacity of the mix to retain fertilizers and water.

(4) "What special fertilizer or irrigation practices should be developed?"

ANSWER: The fertilization program should generally include all six of the major elements supplied by the soil (Nitrogen, Phosphorus, Potassium, Magnesium, Calcium, and Sulphur). Greater rooting depth should reduce the frequency of irrigation. Two irrigations per week, during hot weather, have been ample for the experimental green at UCLA".

Thus Dr. Lunt concludes his paper.

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At long last, we are out of the 'cow pasture' era for putting green soils. The old 1:1:1 ratio (soil, sand and peat) is no longer valid. Research has shown us the way toward better turf that will withstand today's greater play.

UREA - FORMALDEHYDE FERTILIZERS

and

HOW TO SET UP A COMPARATIVE TEST

With many Western Superintendents, the testing of new products on a small scale on their course has become S.O.P. (Standard Operating Procedure). This is to their credit.

This summer and fall many plan to compare the new UF (Urea-Formaldehyde) fertilizers with their old standbys. In making these comparative tests it is important, of course, to apply an equal amount of nitrogen to each area over the given period.

The following rates of application are suggested in comparing your usual fertilizer with that of the UF material. In establishing these rates, an assumption has been made that the 10 lbs. of UF material will furnish approximately one lb. of actual nitrogen per month for nearly 4 months. This is based on the recommendations of some UF manufacturers that the 10 lb. rate is for lawns and greens.

The above assumption may not be entirely fair since we do not know exactly how fast the UF "breakdown" may take place. Actually, the UF material may release less than 1 lb. of nitrogen per month, but will "carry over" for 5 months or longer. On the other hand, your usual fertilizer has been applied so as to furnish the 1 lb. nitrogen rate.

It is difficult, therefore, for the Superintendent to set up an entirely accurate test. Nevertheless, by following the table below, you will apply comparable rates of nitrogen on all test areas. We believe such tests will act as comparative indicators and be of value to you.

Test areas should be 1000 sq. feet and on putting green turf. Test will run for a period of four months.

FERTILIZER	RATE PER APPLICATION	NUMBER OF MONTHLY APPLICATIONS
UREA FORMALDEHYDE (30% N)	10 lbs.	1
AMMONIUM SULFATE (21% N)	4½ lbs.	4
AMMONIUM NITRATE (33% N)	3.1 lbs.	4
UREA (46% N)	2.1 lbs.	4
MILORGANITE (5.5% N)	17½ lbs.	4
GOLDEN VIGORO (6% N)	15-3/4 lbs.	4
CALCIUM NITRATE (15% N)	6-1/3 lbs.	4
10-10-10 (10% N)	9½ lbs.	4

Bear in mind the important factors of cost of material, cost of labor and turf reaction as you judge each test area. We would appreciate receiving your observations from these tests after their conclusion.

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"It is what you learn after you know it all -

That really counts."

Anon.

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