TABLE 3. EFFECTS OF WETTING AGENT TREATMENTS ON OXYGEN DIFFUSION RATES (ODR) AND SOIL MOISTURE CONTENT.

			Days of Draining					
			2		4		2	4
			Soil depth (cm)					
Soil Type	Wetting Agent	Rate of Application	2	4	2	4	Moisture, by Weight	
		ppm	-- g of O_2 x 10^{-8} cm^{-2} min^{-1} --				---- % -----	
SCL*	0	0	8.0†	8.2	8.9	8.1	34.7	33.3
SCL	Hydro-Wet	25	9.4	10.3	10.1	8.5	34.8	33.2
SCL	Hydro-Wet	250	9.1	8.9	10.1	8.8	34.6	33.5
SCL	Aqua-Gro	25	8.8	8.3	8.1	8.5	35.0	33.8
SCL	Aqua-Gro	250	9.7	9.8	8.5	8.7	34.9	33.8
HSL	0	0	10.3	10.9	9.1	10.3	24.0	23.3
HSL	Hydro-Wet	25	10.6	10.7	14.9	9.5	24.1	23.3
HSL	Hydro-Wet	250	11.1	11.1	12.3	9.6	24.1	23.2
HSL	Aqua-Gro	25	10.4	11.2	8.2	9.3	24.3	23.4
HSL	Aqua-Gro	250	10.6	11.0	15.0	9.8	24.2	23.4
MSL	0	0	13.1	12.9	10.2	9.4	31.1	30.0
MSL	Hydro-Wet	25	13.7	13.5	12.7	10.4	31.8	30.9
MSL	Hydro-Wet	250	14.4	14.0	10.2	10.0	31.4	30.5
MSL	Aqua-Gro	25	12.9	13.4	9.7	9.8	30.1	29.3
MSL	Aqua-Gro	250	13.9	13.7	10.1	9.8	30.0	29.2

* SCL, HSL and MSL refer to Southgate clay loam, Hodunk sandy loam and Morley sandy loam, respectively.

† Each number is an average of 30 readings.

Hydro-Wet and Aqua-Gro appeared not to dramatically improve or adversely alter the soil structure. Further research is in progress examining lower compaction rates to determine if these wetting agents improve water movement in the soil and reduce susceptibility of the soil to compaction.

Gypsum Field Studies

Four field experiments were initiated in 1976 to investigate the effects of gypsum (calcium sulfate) on physical properties of fine textured soils. The field plot locations, rates of gypsum applied, application methods and treatment dates are shown in Table 4. On Dearborn Country Club, Bay County Golf Course and Oakland County grounds gypsum was surface applied to 5' x 7' plots of established turf. In the Southgate Golf Course study the treatments were applied to the soil surface, incorporated into the top four inches and seeded the following day with a blend of several Kentucky bluegrasses.

TABLE 4. OUTLINE OF FOUR GYPSUM STUDIES ON FINE TEXTURED SOILS INITIATED IN THE SUMMER OF 1976.

Site Location	Rate of gypsum applied (ton/acre)	Application method	Treatment Date
Dearborn C. C. (13th mens tee)	1, 2, 4, 8, 16	surface	7/07/76
Bay County G. C. (9th fairway)	1, 2, 4, 8, 16	surface	7/14/76
Southgate Municipal G. C.	1, 2, 4, 8, 16	incorporated	9/23/76
Oakland County Grounds	1, 2, 4, 8, 16	surface	7/09/76

Infiltration rates, turf quality ratings and % Poa annua from the Dearborn Country Club study is presented in Table 5. In general the infiltration rates were extremely slow with no treatment responses observable. Quality rates exhibited a slight improvement with higher gypsum rates. However, the lower % of Poa annua in the higher gypsum plots created an artificially improved quality rating. The traffic pattern existing on the experimental site causing a lower % Poa annua in higher gypsum plots.

Further data must be collected before gypsum can be recommended for use to improve the structure of fine-textured soils.

These studies will be continued to determine if gypsum applications contribute to improved structure of fine-textured soils in Michigan.

TABLE 5. INFILTRATION RATES, TURF QUALITY RATING AND % *POA ANNUA* FOR DEARBORN COUNTRY CLUB - GYPSUM

Study, Fall 1976

Treatment #	Material	Infiltration[t] Rate	Turf* Quality Rating	Poa** Annua
		- inches/hr. -		- % -
1	Check	0.05	2.7	82
2	Gypsum, 1 ton/acre	0.08	2.7	74
3	Gypsum, 2 ton/acre	0.02	2.7	65
4	Gypsum, 4 ton/acre	0.02	2.2	37
5	Gypsum, 8 ton/acre	0.08	2.2	67
6	Gypsum, 16 ton/acre	0.05	2.0	48
	Average	0.05	2.4	62

t Average infiltration rate over a 3 hour period; each number is an average of 6 readings.

* Turf quality rating; 1 = best to 9 = bare soil, each number is an average of 3 values.

** Each number is an average of 3 values.

LITERATURE CITED

1. Morgan, W. C., Letey, J., Richards, S. J., and N. Valoras. 1966. Physical soil amendments, soil compaction, irrigation, and wetting agents in turfgrass management. I. Effects on compactability, water infiltration rates, evapotranspiration, and number of irrigations. Agron. J. 58:525-528.

2. Naiden, P. G. 1971. The amelioration of soil compaction on golf fairways by application of gypsum, limestone and surfactants. Master Thesis, Univ. of Maine. Orono, Maine.