

## Minimize Turf Compaction, Turf Researcher Suggests

A golf course superintendent can do several things to minimize turf compaction from maintenance equipment, according to Professor John H. Madison of the University of California, Davis.

He suggests four ways to minimize compaction. One is to use low pressure tires; travel in the same track or in a limited area; minimize the load per tire — either by using lighter equipment, more axles or more tires per axle; and use four-wheel drive vehicles, driving between five and seven miles per hour, rather than faster or slower.

Compaction is the loss of soil pores, and is usually the loss of the larger noncapillary pores," Madison told GOLFDOM. "Compaction results in poor soil aeration, decreased rooting, and heightened susceptibility of turf to invasion by weeds and diseases. Compaction reduces the rate at which water enters and moves through the soil making irrigation management increasingly difficult."

Madison said pressure on the soil is essentially equal to the air pressure in the tires on maintenance equipment. Pressure will be higher when stopping, starting or turning and when tires have lugs. Madison discussed the relationship between pressure and total load.

"Suppose I put an equal load on a truck tire with 35 psi air pressure and a terra tire with 6 psi of air," he said. "The ruts will be different-shaped but the compaction will be the same. If I now increase the load, compaction will be greater. Instead of looking at the rut which shows me how much soil porosity I have lost, suppose I look at the soil to see where the porosity has been lost. I find that with the lower pressure, the loss has been nearer the surface — with higher pressure compaction has extended deeper into the soil."

Madison said this seems important because the coring machine is the only mechanical way there is of trying to relieve the effects of compaction. The coring machine is effective only on the surface layer of soil. There is, at present, no mechanical means available for relieving deep compaction under turf, he said.

"If I simplify now and ignore

factors of texture, moisture content, etc., and consider repeated trips in the same rut, the compaction added is less during later trips and appears more or less to reach a limiting value," he said. "Suppose instead of making repeated passes in the same rut, I travel randomly and repeatedly over an area 100 feet wide as could happen on a fairway with golf carts. We now see an important difference. The soil under the terra tire has suffered less total compaction."

Madison said total compaction will be less with low pressure tires and the more travel is confined to a limited area. "These conclusions are not new," he said, "what is new to me is the distribution of compaction — nearer the surface when the load on the axle is smaller and the pressure lower and deeper in the soil with higher pressure tires or with more load per axle."

## Japanese Beetles a Problem On New England Courses

A build-up of Japanese beetles has been a problem on some New England courses this season, according to Professor C. R. Skogley of the University of Rhode Island.

"The insect seems to be making a comeback and will always be more serious on well-watered turf," Skogley said. "Golf course irrigation systems may provide more easy living for grubs."

Skogley said if a superintendent is aware of considerable numbers of adult beetles or grubs on his course to take them seriously. He said eliminating as many of the adults with a good, safe insecticide (such as Sevin) will help. Treating all grass areas, including roughs, with chlordane by the time the adults are laying eggs should control grubs. Once the grubs attain some size they are difficult to control, he said.

Skogley also said chinch bugs and sod webworms are still about on some courses and that superintendents should keep an eye out for damage from these. There are a number of insecticides with short-term residues that will control these culprits effectively. He said not to use chlordane for these insects. His comments were reported in the newsletter of the Rhode Island Golf Course Superintendents Association.

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