Stop #4

Recycled Rubber as a Soil Amendment

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As world population grows, land becomes a more precious commodity. Landfills are quickly filling to capacity and every effort must be made to recycle items not degradable. With 234 million tires discarded in the U.S. each year, the need for alternative uses and reuses of this non degradable product is paramount. Land shortage also affects athletic fields. As space is limited and budgets are cut, playing fields will be forced to shoulder more traffic, with less time and money for repair. This project addresses both of these problems.

We are examining the use of crumb rubber from used tires as a means to increase the wear tolerance and decrease compaction on turfgrass playing fields. Our hypothesis is that the resilient, hydrophobic properties of rubber will increase pore space. This will make for a safer, more easily maintained field that is less prone to compaction. At various sites around the state, trials and demonstration plots were established to determine the rate of rubber that will show the best combination of these beneficial characteristics. These plots are located on the campus of Michigan State University at the Hancock Turf Research Center (H.T.R.C.), the Varsity football practice fields, the University dairy store, and at Grosse Ile Golf and Country Club.

A factorial array of five treatments (0, 10, 20, 30, 40 percent rubber by volume), incorporated at two depths (three and six inches) was installed at the H.T.R.C. on May 20, 1991. The rubber was weighed, transported, raked, tilled, and raked again, before normal establishment of perennial ryegrass (Lolium perenne) seedlings. Water management of the seedlings was complicated due to large soil moisture differences between treatments and unusually high temperatures in May. The 10% rubber treatment held water consistently, but the surface of the 40% rubber treatment dried out quickly (Figure 1). The test was repeated on Kentucky bluegrass (Poa pratensis) sod to evaluate the effects of sod rooting and traffic on crumb rubber amended soils. Wear will be applied to these plots this fall with the Brinkman Traffic Simulator to mimic sports turf activity.

Another study was initiated to investigate the incorporation of crumb rubber into established turf on a campus path at the M.S.U. Dairy Store. Rubber was topdressed into coring holes and vertical groves. These treatments yielded better color and density than both the check and coring without rubber. The cored with rubber treatment was significantly softer then all treatments and 50% softer then the check (figure 2). Hypothetically, adding rubber to established turf could greatly reduce the cost of creating a safer, easily maintained athletic field or park. Much thanks is owed to everyone at the H.T.R.C. and especially the Michigan Turfgrass Foundation for the funding of this project.

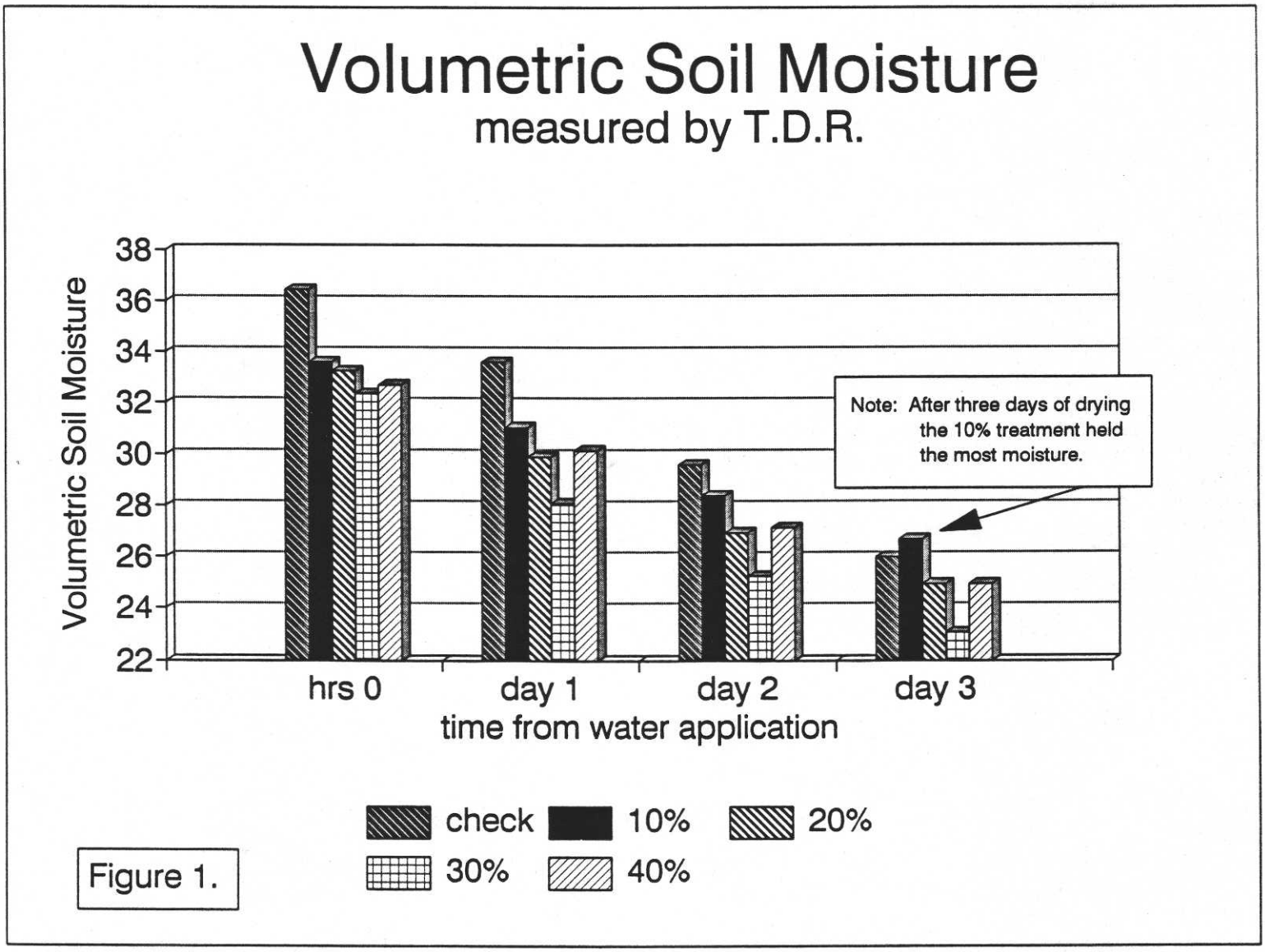
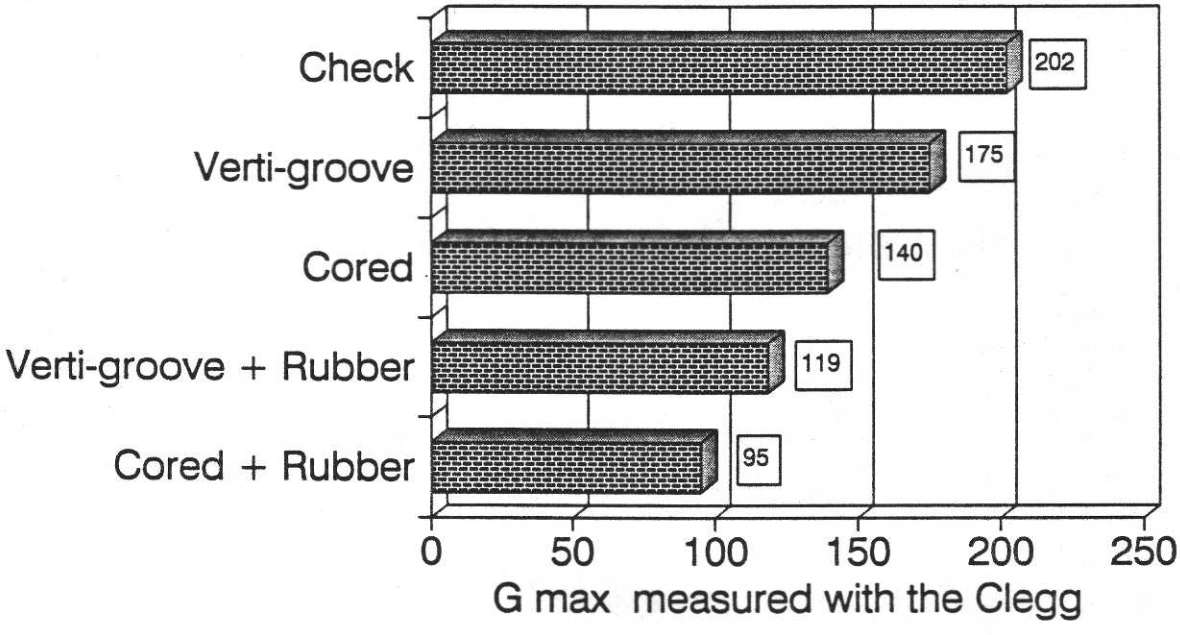

Volumetric Soil Moisture
measured by T.D.R.
Volumetric Soil Moisture
38
36
34
32
30
28
26
24
22
hrs 0
day 1
day 2
day 3
time from water application
Note: After three days of drying the 10% treatment held the most moisture.
check
10%
20%
30%
40%

Figure 1.

Hardness of Established Turf

topdressed with recycled rubber



LSD = 18.5

Figure 2.