

Soil compaction remains serious problem

UNIVERSITY PARK — Compaction of soil remains a serious problem for many farmers, says Donald R. Daum, Penn State Extension agricultural engineer.

When we talk about compaction we are really talking about soil structure, he explains. Soil structure refers to the soil particles — sand, silt, and clay — and how they are arranged. The space

between soil particles or aggregates is called pore space. Pore space contains the water films on the soil particles and the oxygen necessary for germination and plant growth. An ideal soil will contain 50 percent pore space with half occupied by water and half by air.

With modern large tractors, equipment, trucks and cropping

systems that produce annual tillage operations, our soils are becoming compacted. This means pore space is reduced resulting in poor drainage, lower water storage capacity and even poor root penetration. Also, after the rain, plant growth suffers from lack of oxygen because water fills all the available pore space.

Daum recommends several

ways to reduce soil compaction.

Reduce the number of trips over the field by combining implements and operations; this will also save fuel. Reduce the number of tillage operations; consider no-tillage or minimum tillage practices. Don't overwork the soil and don't work the soil when it is too wet.

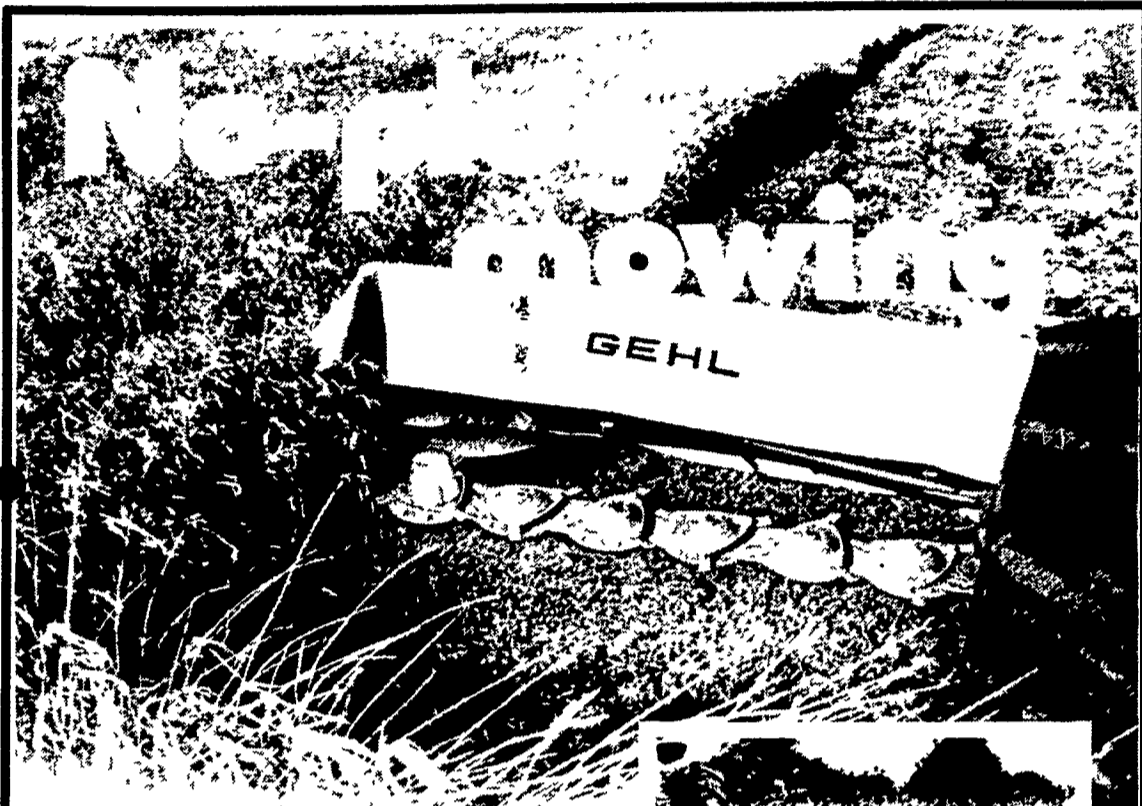
Reduce tire pressure; high tire pressure concentrates the equipment weight on a small tire-soil contact area resulting in excessive pressure in the wheel track. Use wider, so-called "floatation" tires; dual tires are still better.

Another approach is to add organic matter such as manures or cover crops. The organic matter helps by making the soil

aggregates — the large and small clods — more stable. They will support equipment better without pulverizing and compacting.

Daum says that sometimes a switch in equipment may help. For example, some report that a chisel plow will help break up the "plow pan" caused by moldboard plows. However, be careful that new equipment doesn't require bigger, heavier tractors or more trips over the field.

Check your fields for soil compaction, Daum urges. Symptoms include shallow root penetration, poor drainage, poor water holding capacity, large clods, poor crop performance and crusting. Potential yields and profits can be lost by excessive soil compaction.



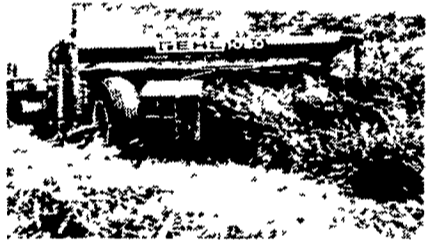
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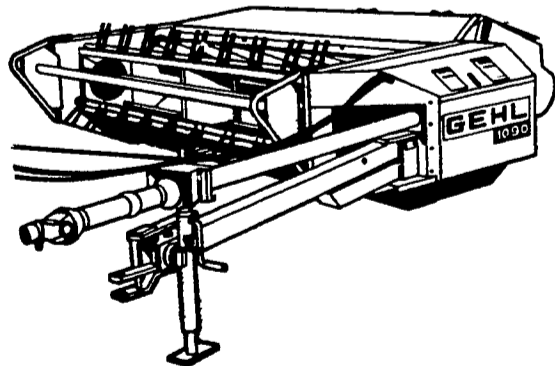


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