

## **UNDOING SOIL COMPACTION**

Soil compaction comes in two stages – turning by thorough tillage, which weakens the soil, and then traffic, which compacts it. Turning dismantles the soil's structure, crumbs that were stuck together come apart, many are shattered into smaller pieces. When you break the soil into grains, the next footstep will turn it into a solid block. The finer and fluffier you work the soil, the more you weaken it.

In the second stage of compaction, pressure from traffic packs the soil particles together. You end up with a tighter arrangement than you started with. The air spaces disappear, and you're left with smaller micropores, that fill up with water and hold on to it. A soil that used to drain well stays wet with standing water. When a sprinkle leaves the soil crusted, it's a sign of poor structure. Rain runs off. Lacking air spaces, the soil is short of oxygen. Everything underground suffers. We overlook what roots need, even when we do everything else right. With good structure, the soil holds plenty of water and air, so the roots grow readily and keep the leaves supplied with water.

Compacted soil stunts more than the plant. Having a lot of organic matter in the soil is not as important for soil structure as having a steady supply being worked on by the good organisms. They build the soil. And they can't work without oxygen. Compost has to decompose to do any good.

Compaction is persistent. On some soils it's almost irreversible without help. There are three things you can do to reduce compaction. In early spring, when you're itching to plant, wait until the ground is dry. Turning wet earth smears soil particles together. You end up with dense clods that dry out like rocks.

Vary the depth you till from one season to the next. The pressure of a tiller packs the soil under it in a thin layer. If you always work at the same depth, that layer compacts densely, shutting out roots and damming water. If you're turning the soil with a spade, treat it gently. Throwing it causes compaction the same way throwing bricks would. Shift the topsoil rather than throw it, partly to keep the soil layers in their natural order, but also to avoid smashing the soil structure.

There are only two sure cures for compaction – a steady supply of compost and tillage without traffic. The best way to avoid traffic is to lay out your garden in wide beds and permanent paths. You confine compaction to the paths, not the beds. You can mulch or pave the paths. If you spade the soil, work from a digging board which will reduce foot pressure below the danger point. You can do less damage also by walking backwards when cultivating.

However you work the ground, adding organic matter and subtracting traffic will improve your soil. One day, you might even give up soil turning. Once the soil structure is rebuilt, you could preserve it and keep on gardening by lightly working a bit of compost into the top 5cm of soil before planting.