



Compaction

WHY IS THIS IMPORTANT?

Compacted soil can slow or almost stop growth for some plants. The soil is made up of mineral particles -- sand, silt and clay. But it also has essential pore spaces, some small and some larger. While all pore spaces are tiny to the naked eye, the larger of these minute spaces are called *macropores*. These macropores provide space for water and air. They also allow excess water to drain out, preventing the roots of plants in the soil from becoming waterlogged or deprived of necessary air. A compacted soil has little to no macropores. The pores are in a sense crushed to be much smaller – *micropores*. Micropores are suited to hold water, not allowing the excess to drain off. Therefore,

plants can't build strong root systems, slowing their overall growth.

ACTIVITY

(1) Are there compact spots?

MATERIALS:

LONG HANDLED POINTED BLADE SHOVEL

CLIP BOARD (OR HARD SURFACED ITEM)

PAPER AND PENCIL

MASKING TAPE,

MAGIC MARKER

10-25 STICKS (WOODEN SKEWER STICKS, FOR INSTANCE)

A FRIEND, NEIGHBOR OR FAMILY MEMBER (AS A REALITY CHECK)



This activity is allied to the activities on drainage (infiltration and percolation) in Step #4. In this step on compaction, however, the focus is on the physical nature of the soil itself and how easy or difficult it is to cultivate.

It is an activity involving some guesswork and judgment rather than a specific measurement. We use words like “it feels like”.

Do this test when the soil is relatively dry, when it hasn't rained for several days.

Walk around your property in 10 or more places. Mark spots with the sticks that you will test. Tape a flag-like marker onto the stick. Mark each with a unique number. Choose spots at random if you like or those where you suspect you will be putting a landscape, a vegetable garden, a flower bed, a shade tree, and the lawn. Don't worry if you aren't sure yet just where those elements of your garden and landscape will be. You can always do a follow up test again later. For now, you want to get an idea of how compact your soil is in various parts of your property.

Use your foot to push the point of a long-handled shovel about half way into the ground. If your shovel hits a stone, move the shovel a little to get a true test. If you hit tree roots, repeat the test nearby to determine the extent of the roots. If tree roots are extensive, stop testing that area for compaction.

Decide how much effort you used and rate each site **hard, average or easy**.

Since your ratings are based on what it feels like to you, ask someone else to do the push test and compare results.

ESTIMATED TIME:

15 MINUTES OF PREPARATION AND 15 MINUTES PER PERSON FOR 10 TEST SPOTS

Everyone's strength will be different on this test, but after a few trials, you will get the sense of it. Each hard, average and easy rating is relative to the other places on your property.

While this test is far from accurate, it helps in estimating where the problem areas might be. It is not uncommon for gardeners to be shocked to find compact sites.

(2) Visual Observations

Has the area been used for frequent parties? Are there footpaths that people have created?

Is the area sometimes used for parking?

On new home sites or where building additions were made, construction equipment may have compacted soil extensively.

USING WHAT YOU FOUND IN THIS STEP

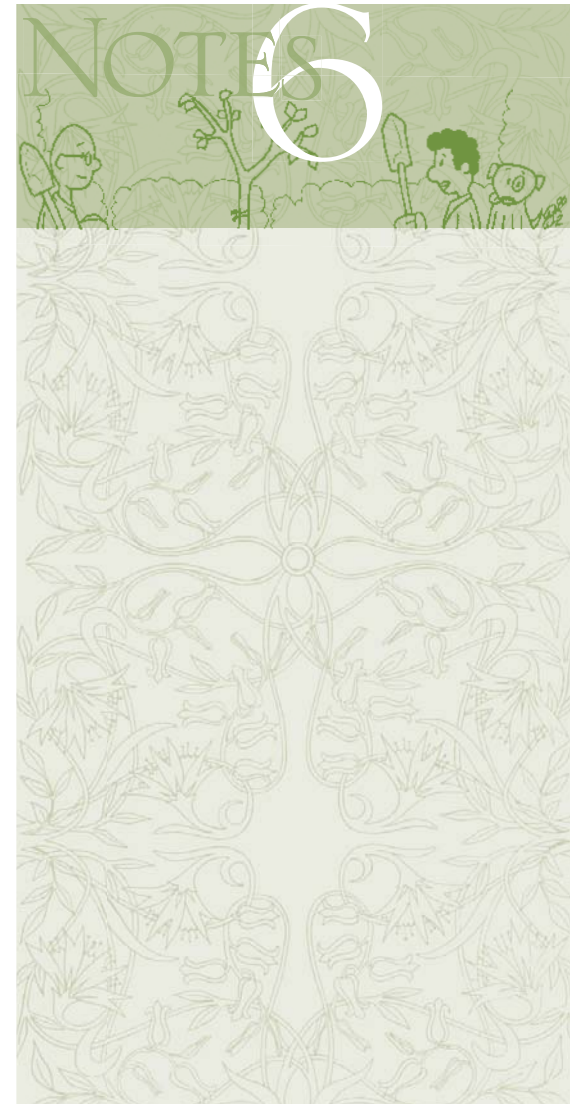
Once you are comfortable that you are consistent and have tested as many spots as you want at this point, transfer to the sketch you drew in Step 1 (Garden and Landscape Area) any spots that are potential problem areas.

Use a simple indicator, such as:

- C for compact (**hard** ratings)
- PC for partially compact (**average** ratings).
- Mark where you found excessive tree roots

C spots need priority attention. There is always room for soil improvement on the PC spots. It isn't necessary to mark the spots where the shovel was easy to push through the soil (**easy** ratings). Avoid planting where there are excessive tree roots close to the soil surface.

Amending compacted soil with organic matter will go a long way into loosening the soil and re-establishing the macropores in that spot. Try to amend an entire bed, not just a planting hole. As roots grow, they move into the surrounding soil around an original planting spot, so it helps with long term garden success to have an uncompacted area instead of just an



uncompacted spot. For more information on how much organic matter to add to different kinds of garden and landscape sites, read “Using Organic Matter in the Garden.”

In very compacted soil, you might need a special tool called a mattock or pickax to break through the soil to amend it before you plant.



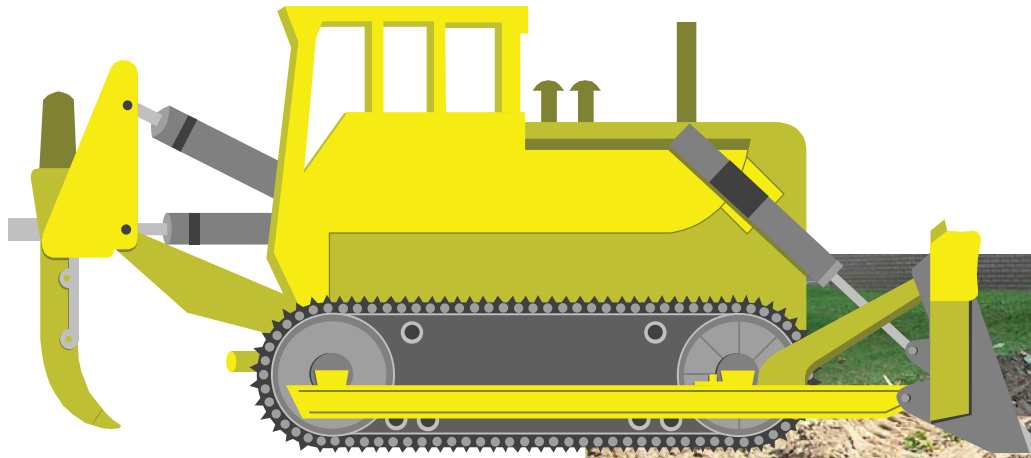
CORNELL STUDENT USING PICKAX TO CREATE GARDEN ON FORMER PARKING LOT SITE

FOR FURTHER READING

Dealing with Soil Compaction, Dr. Nina Bassuk, Cornell University www.gardening.cornell.edu/factsheets/soil/compaction.html

Using Organic Matter in the Garden www.gardening.cornell.edu/factsheets/orgmatter/index.html





Construction equipment compacts

