**Soil Texture**

Today we're assessing a really important soil characteristic, and that's called soil texture. Before we go on to our test, it’s worth appreciating exactly what's in the soil at my site here.

As well as a lot of water and air, there's other things too. We have lots of dead organic matter within this soil, as well as lots of living things too like bacteria; and fungi; and smaller invertebrates like earthworms. One other big ingredient is something that we call mineral content, or the small ground-up bits of rock that make up this soil. Scientists use three words to describe the different sizes of that mineral content: we call it either sand; silt; or clay. Sand is the biggest grain size, and you can see that easily with your naked eye. The next size class, smaller again, is something called silt, which is small plate-like structures, that you can just about see; and the last one, which is the tiny grains of clay, which you can hardly see with your naked eye.

Soil texture can influence soil in a number of ways. If a soil is very sandy like this one, it's not very good at holding on to nutrients, yet its ability for water to enter it and pass through it is very good; so drainage is excellent in a sandy soil. If you've got a soil with a lot of clay, its ability to hold on to nutrients is excellent; but it also holds on to a lot of moisture too, which can lead to very damp or even water-logged conditions.

Before I do my soil test, it’s worth mentioning that you should always get permission from the landowner before you do so; and because you're going to be handling soil, you can either pop some gloves on your hands or you can wash them thoroughly afterwards before you eat or drink anything.

Today, to help us through the process, we're going to be using the soil texture guide that you can download from the OPAL website as part of our OPAL Soil and Earthworm Survey. We're going to start over here, and the questions are going to guide us through the process, and at the end we're going to find out what kind of soil texture we have.

I've just selected a soil sample from about 10cm depth, and you're going to want about enough to form an egg-sized shape in your palm. To make the soil easier to work in your hand for this test, it sometimes helps if you add a little bit of water to it to make it slightly more malleable. Once you've done this, the first question on my soil texture test is to try and roll the ball into a spherical shape in the palm of your hands. If you can do that, it tells you that it's not pure sand, and you can go onto the next question, which is whether we can flatten this ball into a ribbon shape. I'm going to use my finger and my thumb to do that; it can take a little bit of work; and I'm going to squeeze the soil until it's approximately 3mm in thickness and quite long as a ribbon shape. If I can do that, my next stage is to start working the soil ribbon over my fingers so that its supporting its own weight, but at some point - like you can see this one is - it's going to want to break. At that point you want to take the measurement of that distance. In this case, it's broken after about 3cm. My last step in my texture test is to take a small pinch of soil and to rub it between my fingers. It will either feel very smooth; very gritty; or something in between. This one is a very gritty soil.

Soil texture charts like the one we're using today give you a standardised method to categorise the soil based on the proportion of these three size classes: sand; silt; and clay. The chart leads you to which texture category you have, based on how easy it is to work the soil in your hands. The soil we're testing today is a sandy clay loam. This means the soil mineral content is mostly composed of sand, followed by clay, with a very small quality of silt grain-size.

One other bit of information that you can gather at this point is by taking a small soil sample in a container like this and adding a small amount of vinegar: you can test if there's any calcium carbonate in the soil. The vinegar reacts with the calcium carbonate and lets off a gentle fizz that you can see and you can hear if you hold your ears close by. Calcium carbonate is present if there is something like chalk underneath the soil, and in that case certain plants are going to want to live whereas others may not be able to.

All of this information is extremely important to lots of people. Farmers and gardeners are going to be really interested in this because they're going to want to know which plants can grow in a specific soil type; and other scientists might be interested in looking at the interaction between biodiversity and the soil itself.