Cotton strip test for soil biological activity

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Because we can't see microorganisms in soil we want to find another way to measure them. One way is to measure the amount of total decomposition by using cotton strips. The cotton is used as a food source for fungi and bacteria. The more they break down the cotton, the more decomposition activity there is in the soil.

This is a comparative test, so choose several sites for comparison (eg best / worst soils) or for your own trials of soil additives. Place 3 strips per site for a good representation.

Buy unbleached calico from a material shop (the most natural cotton fabric available) and cut it into 20 x 15cm strips. Draw a line in texta 5cm from the longest edge. Rinse the calico in cool water to remove manufacturer's stiffener, and dry.

At each strip site, create a vertical slit in the soil with a flat spade. Then place the calico strip on the spade with the line closest to the handle, and the other end wrapped over the bottom of the spade. Insert this into the soil so that the line is flush with the soil surface. Push back the soil to have good contact with both sides of the calico. Mark each site with something very easy to see and very close to the calico – you need to find them later!!

The time required to see decomposition depends on your location, season, moisture and soil type – you may need to do your own trials. Generally 3-5 weeks in Spring is a good guide and starting point. Warm and wet weather will help decompose the cotton faster, and cold and dry will be slower.

Carefully remove the strips (dig them out, don't pull them as they will tear) and wash them in water to remove all the soil. The strips will have concentrated bacteria and fungi on them so be careful with hygiene, ie maybe use gloves, and don't breathe in close to strips. Compare the amount of decomposition on the strips. Look for where your activity is highest in the soil profile – that is your active zone. Estimate how much calico is eaten away as a percentage and compare sites. Do the tests over time to see if there is a trend developing.

mulch layer

soil surface

soil layer