

## **#SoilBasics #Groundchat**

**Date:** August 1, 2014

**Topic:** #SoilBasics: soil temperature & how it's used in gardening

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**Due to changes in Twitter, tweets were not archived in time. Below are my tweets prepared for the #SoilBasics #groundchat**

It's 2 pm. Time for lively tweets & discussion about soil on #groundchat!

It's the first Friday of the month, which means it's #SoilBasics on #groundchat.

#SoilBasics is just as it sounds. I cover abasic property of soil & how it relates to gardening. #groundchat

If you are joining us for today, give us a shoutout and let us know where you are tweeting from & what your weather is like. #groundchat

It's a lovely sunny day in Brampton, Ontario. Zone 5. Temps 29 C (F) #groundchat

This month on #SoilBasics I'm covering soil temperature and how it affects gardening. #groundchat

Why are soil temperatures important to gardeners & gardening? #groundchat

Most plants are more sensitive to soil temperature than to above ground air temperature! #groundchat

Surprisingly, adverse soil temps generally influence shoot growth & photosynthesis more than root growth. <http://bit.ly/1qPMIpY> #groundchat

Here's a few rough guidelines to when/how soil temperatures affecting plant growth #groundchat

At soil temps less than 40 F (4C) there's no plant growth & bacteria & fungi are not very active #groundchat

Between 40-65 F (4-18 C) soil temps there is some plant growth #groundchat

Between 65-70 F (18-21C) soil temps, fastest plant growth #groundchat

Between 70 to 85 F (21-29C) soil temps, some plant growth #groundchat

Above 85 F ( 29C) no plant growth #groundchat

But these are rough guidelines. It really depends where the plant species have evolved from #groundchat

Most plants have a narrow range of soil temps for optimal growth...and it usually depends on where the plant evolved #groundchat

e.g. corn & loblolly pine, which evolved in warm regions, grow best in soil temp range of 25- 30 C (77-86 F) #groundchat

e.g. cereal rye & red maple, which evolved in cool regions, grow best in soil temps 12 – 18 C (54- 64 F) #groundchat

But even plants from tropical origin (corn) can be badly affected by soil temperatures higher than 40 C (104 F) #groundchat

That's why shade cloth & mulch are so important in very hot areas! Shade & mulch keep the soil temperatures cooler! #groundchat

Soil temperatures are easy to obtain. Use a soil thermometer (or compost thermometer or oven thermometer) #groundchat

Measure the soil temperature at 4 or 6" deep, in the morning and in the evening to give you a realistic average. #groundchat

@DannyLipford's Today's Homeowner has a great article on "How to Measure Soil Temperature for Planting." <http://bit.ly/1ogRa9l> #groundchat

But if you want to quickly check, or you have a huge garden/farm, there are daily soil temperatures maps online! #groundchat

@Syngenta GreenCast uploads daily soil temperatures for USA & parts of Canada <http://bit.ly/1kq9WjO> #groundchat

What is your soil temperature? I'm in Brampton, Ontario. The soil temps read between 65 -70F (18- 21C) #groundchat

I tested my soil to compare with the GreenCast reading. My soil temp are 72 F (22C). Close. I've a warm SW-facing backyard! #groundchat

Almost all gardeners know that soil temperature is critical for seed germination, so let us start with that one!

Many plants require specific soil temperatures to trigger seed germination!

Seeds of prairie grasses & grain crops require a period of cold soil temperature (2-4 C/ 36-39F) before germinating. #groundchat

The horticultural term for this period of cold soil germination requirement is vernalization #groundchat

Soil temperature blogs blossom in the spring... with all the ideal temperatures for vegetable seed germination #groundchat

@MorganExtension has an extensive article on germination temperatures for many vegetables. <http://bit.ly/1rWpFJC> #groundchat

It's a useful guide for spring and mid-summer vegetable planting <http://bit.ly/1rWpFJC> #groundchat

Plant when soils reach minimum temperature measured at 8 a.m., 4 inches deep. Beans are an exception, being measured at 6 inches deep. #groundchat

Maximum temperatures are listed in regards to high soil temperatures that may interfere with seed germination in the summer. #groundchat

Cool season vegetables, ie lettuce, peas & spinach) have a maximum soil germination of 70F (21C) #groundchat

Whereas warm season vegetables (corn, tomato, squash, watermelon & cucumber) have a maximum soil germination at 100 F (38 C) #groundchat

And we all know that many spring bulbs, planted in the fall, require a cold period so that they can flower in the spring! #groundchat

Since temperature affects microbial activity, it also affects nutrient availability. #groundchat

Warm temperatures increase activity, speeding up decomposition & releasing more nutrients #groundchat

Cold temperatures greatly slow down activity, and therefore slow the release of nutrients from organic matter. #groundchat

Plants can experience a temporary deficiency of phosphorus or nitrogen in early cold spring soil because of slow microbial decomposition. #groundchat

Adding artificial fertilizers doesn't help much if the soil temps are below optimum for a particular plant species #groundchat

Root function such as nutrient uptake & water uptake are sluggish with soil temps below the optimum for that plant species. #groundchat

Speaking of cold, frost heaving can pull perennial tap-rooted plants out of the soil! <http://iwheat.org/node/135> #groundchat

Frost heaving of alfalfa. Roots almost right out of the ground! <http://bit.ly/1qyBjGh> #groundchat

Ok, so what as gardeners can we do to moderate soil temperatures and/or modify our gardening? #groundchat

We can use organic mulch to cool soil during the summer (and it slows water loss too!) #groundchat

Since seeds germinate best in warm soils, use transplants for spring planting, and direct seeding for mid-summer plantings (fall harvest). #groundchat

We can use black plastic mulch to warm soil, increasing yields and earliness of crop. #groundchat

In warm sunny areas (max air temps >35 C (95F), cover soil with a clear plastic cover to control weeds & soil insects. #groundchat

Under the clear plastic cover, soil temps soar to 50 to 60C (122- 140F), which kills fungal pathogens, weed seeds & insect pest #groundchat

The angle of the sun's rays affect soil temperature. Take advantage of this.

Plant veggies on the south-facing ridges. The ridges only need to be at minimum 10 inches high ( 25 cm) #groundchat

Fairbanks, Alaska, mid-afternoon soil temps in early May were 15C warmer on the south side of the ridge, & 8C warmer on level ground #groundchat

As you probably noticed moist soil is cooler than dry soil. And dry soil heats up faster than wet soil #groundchat

Rain/irrigation warms soil in the spring & cools the soil in the summer!  
#groundchat

Other things that soil temperature affects include thawing of the permafrost, which affect climate change

Soil heating by fire is very important for germination of some plant species seeds  
#groundchat

Slash/burn fires, burning hot and for a long time, depletes soil organic matter & kills soil organisms.

Heating up soil can remove certain organic pollutants from contaminated soil.  
#groundchat

That is all I have for today for #SoilBasics. Hope you all enjoyed today's  
#groundchat as much as I did.

Thank you everyone for taking out time out of your busy day to attend and comment on #SoilBasics #groundchat.

You can always show your appreciation by donating at the #groundchat tip jar ;-)  
<http://bit.ly/1cchiAj>

Thank you for your support. Tipping is like giving #groundchat a high-five with money in your hand. <http://bit.ly/1cchiAj>

I'm at #GWA14 in Pittsburgh next Friday. So it's going to be free forum on #groundchat

The following Friday (August 15) arborist @bullmeister guest hosts on #groundchat. His topic: structural soil for trees.

Enjoy your weekend everyone!