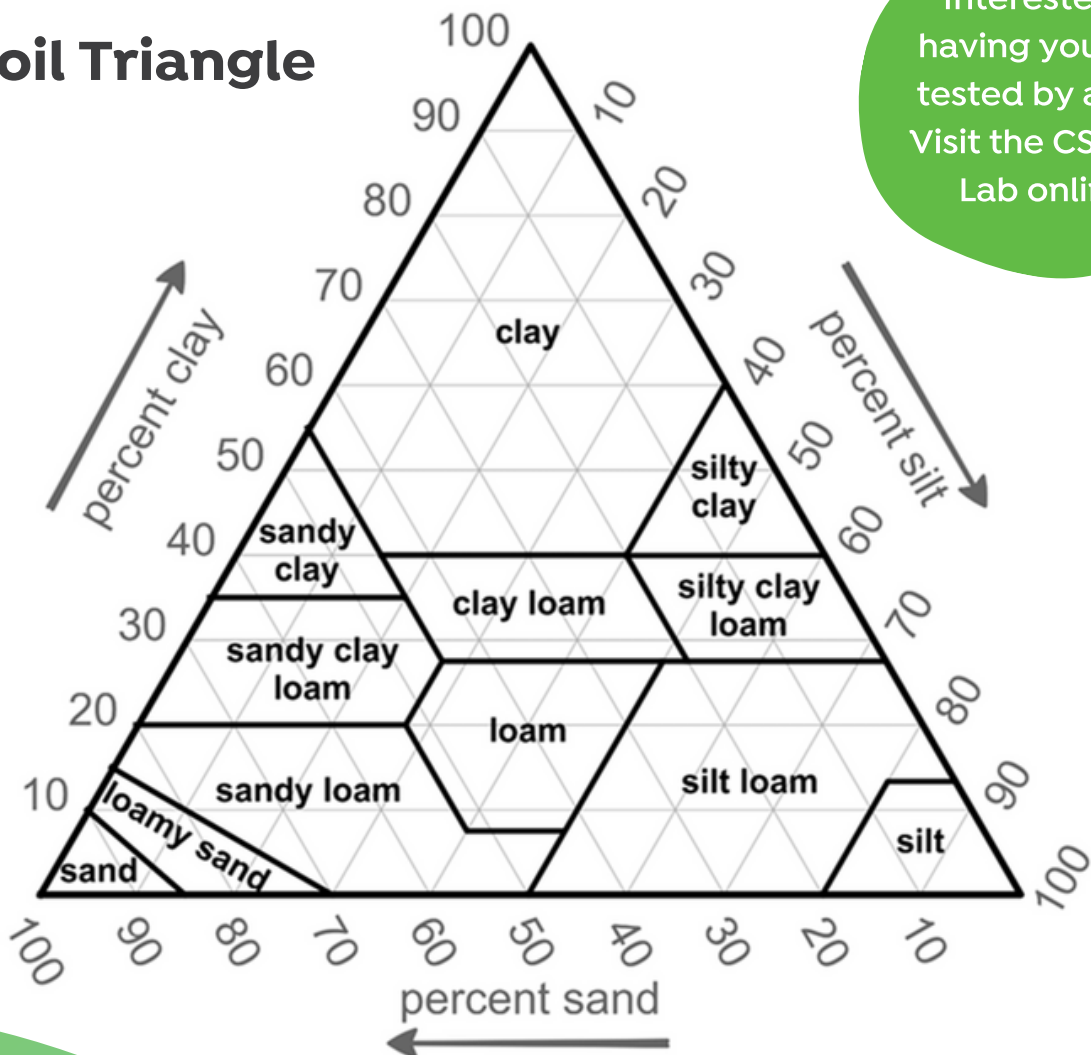


# START WITH SOILS

In partnership with:

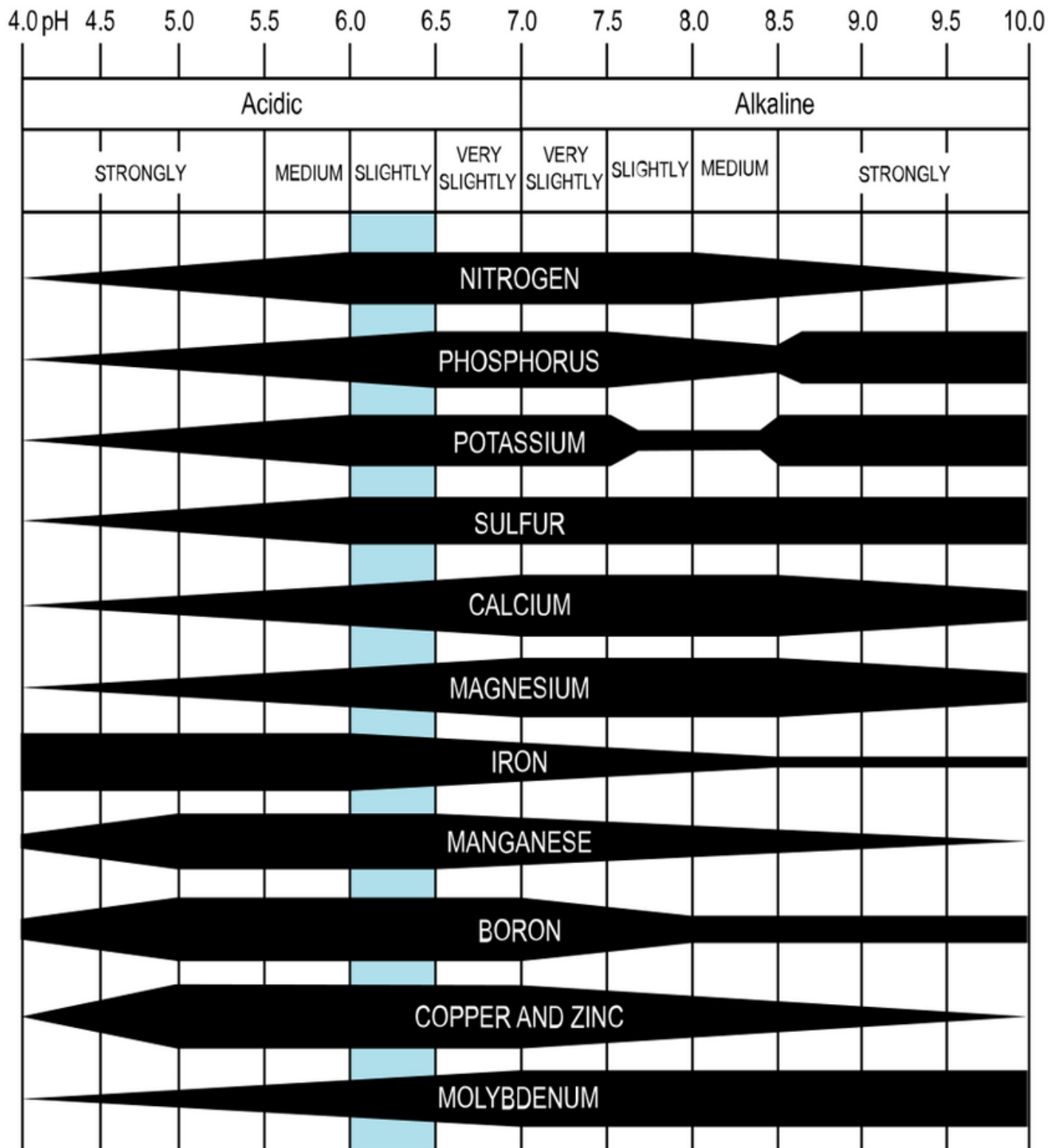


## Soil Triangle



Interested in having your soil tested by a lab? Visit the CSU Soil Lab online!

# Nutrient Availability



**Sources:**

[https://en.m.wikipedia.org/wiki/File:Soil\\_pH\\_effect\\_on\\_nutrient\\_availability.svg](https://en.m.wikipedia.org/wiki/File:Soil_pH_effect_on_nutrient_availability.svg)

[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2\\_054311](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054311)

# Manure As Soil Amendment

Manures are generally broken down into two types:

- Hot, from omnivores and carnivores (such as chickens and pigs). High in nitrogen and appears slimier and smelly.
- Cool, from herbivores and ruminants (such as cows, sheep, horse, goat, alpaca). It has a mild odor and is dry and crumbly with bits of visible organic matter.

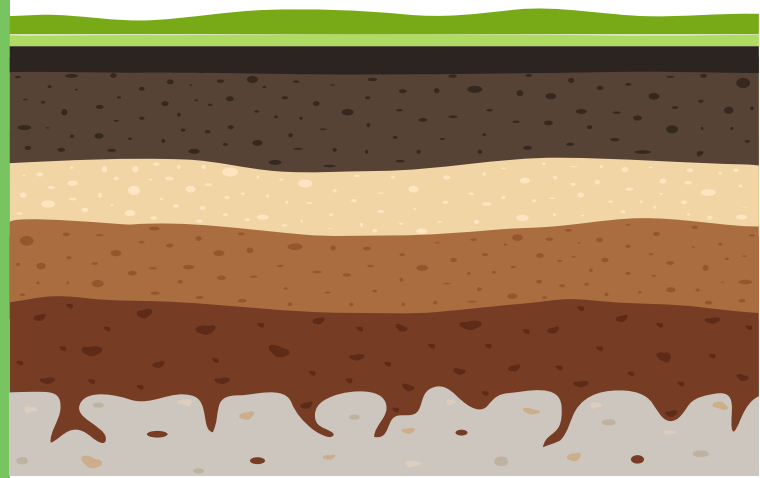
All hot types of manure need composting and/or ageing so that their high nutrient content doesn't burn the plants. Cool types of manure can be used directly in the garden but do benefit from a month or so of ageing.

## AS SOIL BUILDERS

Although manure contains nitrogen for leaf formation, phosphorus for plant metabolism and root support, and potassium for flowering, the real value of manure lies in its soil-building qualities. Manure can correct both clay and sandy soil conditions. It helps to achieve just the right amount of water holding capacity in the soil, yielding that fluffy loam that produces thriving plants that resist disease. Manure attracts aerating earthworms like crazy, which add to the manure party with their own deposits of worm castings. Beneficial microorganisms also flourish, outcompeting pathogens in the surrounding soil.

## AS LIQUID FERTILIZER

All manure can also be used as liquid fertilizer. For liquid manure, add a cup or so of manure to 7 liters of water in a bucket and leave it for a few days to leach the nutrients out of the manure. Give it a stir each day and when it's the color of tea, dilute 5:1 with water and use on the garden.



MANURE	pH and nutrients	Use	Warning
Chicken	Hot: highest in nitrogen and phosphorous	Use a ratio of 1 manure: 4 carbon-rich material (such as straw, dried leaves, shredded paper, or soil) for a balanced compost	It must be aged and/or composted to prevent burning or even killing plants
Cow	Cool: Cow manure has the optimum 25:1 carbon to nitrogen ratio	It can be directly tilled into the soil without the worry of over fertilizing, but aging it for a month or so is optimum	
Goat	Cool: Goat manure is rich in nitrogen levels which makes for an excellent soil conditioner. It improves soil texture and water retention	Mix equal parts goat manure with straw and or ask farmer if manure was scooped from bedding (which will already be 1/2 straw). Then apply before or during growing season	
Sheep	Cool: slightly lower in nutrient content than goat or cow. It also contains potash and is great for improving structure of soil	Because of lower nutrients it won't directly harm plants and can be applied as a slow release fertilizer (around the base of plants) as it naturally comes in round pellets	
Alpaca	Cool: The nitrogen and potassium content of alpaca manure is comparatively high	If the alpaca pellets are collected with bedding, they can be spread around fruit trees as a slow release fertilizer (similar to sheep manure)	
Rabbit	Cool: Smaller (pellets) in quantity but comparatively high in nitrogen	Rabbit pellets also make fabulous liquid fertilizer, which when diluted will give the plants a valuable boost at critical times in their growth	Manure should be collected with the bedding material and will create a good balanced mix for composting
Horse	Cool: Horse manure has a higher nitrogen and nutrient rate than cow manure	it can be directly applied to the garden as it has a balanced carbon to nitrogen ratio of 20:1	Fresh manure should be aged or hot composted, as horses don't digest weed seeds
Pig	Hot: this manure is fantastic! Worms adore it and plants thrive in it	Pig manure definitely needs to be composted	Get the compost wet and hot so that it will break down and kill any dangerous (to your health) organisms
Worm (Vermiculture)	Cool: a well-balanced fertilizer (if you like having worms around in a bucket :)	Used as Castings on the soil at the base of plants and in tea	Know what to feed and don't overfeed-- it can kill them

#### Sources:

<https://pipmagazine.com.au/grow/types-of-manure/>

<https://www.thespruce.com/use-manure-in-flower-garden-1316000>

<https://www.agrifarming.in/goat-manure-advantages-and-disadvantages>