bettersoil Alliance

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Soil Acidity

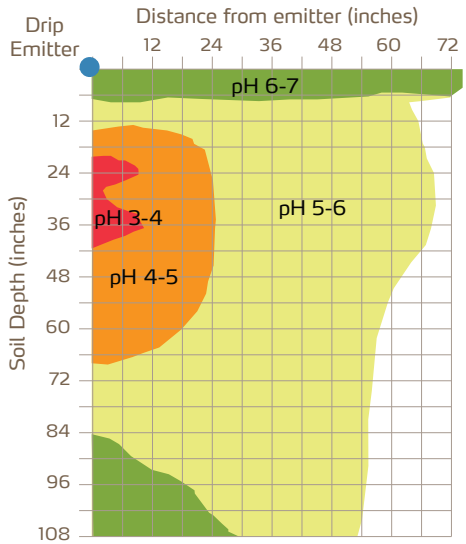
A major component of soil health is maintaining soil acidity within the range where plants and beneficial microbes can flourish. Soil pH is a key measurement of nutrient availability and microbial activity, which all impact root growth and plant health.

Since the pH affects almost all chemical and biological processes in the soil, it is important to avoid extremes that will harm soil and plant health. Acidic soils tend to release toxic aluminum which will damage root heath and slow crop growth. Acidic soils also tie up essential plant nutrients, which can reduce crop performance. Furthermore, soil acidity tends to suppress the growth of many beneficial bacteria. Excessive acidity also slows down the storage of important soil carbon and the overall microbial biomass.

Soil acidity has a harmful effect on root growth and plant health (wheat and clover shown)
https://www.agric.wa.gov.au/soil-acidity/effects-soil-acidity

The YaraLiva PhycoTerra® solution

Many of the common fertilizers currently used by California almond growers include ammonium and urea sources of nitrogen. These fertilizer sources (including animal manure) are converted by soil bacteria into nitrate, with an accompanying release of acid. When these fertilizers are repeatedly applied, the soil pH will gradually decline due to the release of acid by nitrifying bacteria. In some soils, the fertilizer-induced pH drop has declined to a point where almond roots are no longer active and healthy, especially when roots are concentrated beneath a drip emitter.



Soil acidification beneath a drip-irrigated almond tree receiving urea fertilizer dropped the pH from 7 to less than 4 in ten years of fertilization (Meyer, 1994).

Continued...

The YaraLiva PhycoTerra® solution (cont'd)

$$2NH4_{+} + 4O_2 \text{ ----> } 2\ NO_3^- + 2H_2O + 4H^+$$

Ammonium **Nitrate** **Acid**

The use of YaraLiva-based calcium nitrate fertilizers supplies nitrogen primarily in the nitrate form, eliminating the acid formation that always results from other common nitrogen fertilizer sources. The soil and plant-damaging effects of this pH drop are therefore avoided when YaraLiva is used.

The addition of calcium in an almond nutrition program also helps counteract soil acidity issues. The harmful effects of aluminum in the rootzone are reduced when calcium is available to replace the toxic aluminum in the soil. Even though many soils contain abundant calcium, providing additional calcium into the wetted root zone often has a beneficial effect on the soil, enhances the microbial community, and improves the root environment.

The soil microbial populations in California orchards survive in a dormant state for extended periods under hot and dry conditions, waiting for fresh substrate (food and nutrients) in a moist environment before becoming active again. When the combination of PhycoTerra®-based carbon and immediately available nitrate from YaraLiva are added together in the irrigation water, conditions are quickly optimized for soil and plant health.

When activated, these previously dormant microbes provide valuable support to improve soil properties, which in turn creates a suitable environment to maximize root health. The PhycoTerra® supplies a boost of complex energy sources so soil microbes can go to work improving the soil properties and the water-holding capacity. The YaraLiva supplies immediate nitrate and calcium nutrition to prevent soil acidification, adds a soluble nitrogen source, and provides calcium to boost soil and root health.