USDA
United States Department of Agriculture

NATURAL RESOURCES CONSERVATION SERVICE

22A

SOIL TECH NOTES

Rhizophere

What is it and why is it important for a good soil condition??

The Rhizosphere is a narrow region existing immediately around a living root (within 1 to 2 mm). This region exists *because* of the roots and the conditions they produce.

Living roots release a multitude of organic compounds, including plant exudates and sloughed-off root cells.

These compounds attract bacteria, which feed directly on the proteins and sugars.

Number of bacteria in this area can be as much as 2,000 times more than in surrounding soil. This can aid significantly in breakdown of residue and the release of inorganic nutrients.

We also find Fungi and actinomyces here in great numbers.

Protozoa and nematodes feed on the increased number of bacteria present, and assist in opening up more soil pore space.

Nutrient cycling begins here!

The **plant** is greatly affected by the microbial population it stimulates because the root zone included is the area from which mineral nutrients are obtained and through which potential pathogens must penetrate. Healthier zone, healthier plant.

Symbiotic relationships can exist in this area, which benefits the microbes and increases the health and production of the growing plants.

As with SOM, activity of the microbes in the rhizosphere decreases dramatically with depth. Surface layer again is the area that most needs our attention.

Different plant species have a strong effect on which microbes are present in their rhizosphere. Actually, this population is more dependent on **plant types** than **soil characteristics**. (Plant Diversity!)

As the growing season progresses, and the roots began to die, the readily available carbohydrates are quickly broken down and the population of microbes in the rhizosphere declines. If you remove the "cash crop" and include cover crops, we can offer a longer time for healthy microbial activity to be present and working in the soil. (Plant Diversity!)