



Canadian Organic Growers
Cultivons Biologique Canada

Linking the Role of Plant Roots to the Principles of Regenerative Agriculture



Introduction



By applying your knowledge of roots alongside regenerative principles, you can build resilience in your soil so that your crops are better equipped to deal with climatic conditions. Roots have a powerful role to play in soil regeneration and in this section, we will look at the ways that diversity, livestock integration and armouring the soil facilitate the process of regenerating soil health.



Principle of Diversity

Plant diversity is a cornerstone principle that can be integrated into your management via intercropping, cover crops, and crop rotation. These practices all have cascading effects upon soil health. As plant diversity is increased, new roots (and root types) and their association with symbiotic microbes diversifies, and consequently more plant resilience and disease protection can be achieved.

Intercropping and Cover Cropping Systems

Intercropping systems in particular can encourage the flow of nutrients at different levels because of the different root systems involved, and this is especially true when plant functional groups are utilized. By practicing crop rotation and cover cropping, future nutrients needed in the system can be anticipated and planned for accordingly, such as incorporating legumes in your rotation for nitrogen-fixing. Cover crops in a shoulder season can also be utilized for both future nutrient needs and increasing biological activity by keeping a living root in the ground.





How Is Diversity Linked to Root Growth?

Overall, it has been found that plant diversity improves the overall root volume and soil organic matter of the plants involved. By having a diversity of roots, you can create a soil sponge that will help save and regulate water during droughts, as well as have a faster rate of water infiltration during floods without losing structure.

Linking the Principle of Livestock Integration and Root Growth



In a recent study by Moore *et al.*, researchers studied the effects of soil health on grazed cover crops and found that grazing had beneficial effects on root mass. They also found that both carbon and nitrogen pools in the soil increased, leading to greater nutrient cycling. It is also worth noting that the excrement left from the grazing cattle also enhances the biological life in the soil, further boosting soil health.

Linking Root Growth to the Principle of Armouring the Soil

Roots are sensitive to heat, and this creates cascading effects on all plant processes. One of the most effective management practices for conserving root health is armouring the soil. This can be achieved through practices such as roller crimping, maintaining a well-covered canopy, and leaving plant litter on the ground. Bare soil can be five to twenty degrees hotter than the ambient temperature, so it is critical to reduce heat stress in the soil by armouring it in order to maintain plant root health.



Conclusion



Roots play an important role, both in regenerative principles and management practices. By honing this knowledge, you can gain a more holistic view that opens possibilities for utilizing cascading effects to your benefit.



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