

Perspective

Impact of green manure on soil: Cultivating sustainability beneath the soil

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DESCRIPTION

In the ever-evolving landscape of sustainable agriculture, a practice rooted in ancient wisdom has taken center stage: green manure. As we grapple with the challenges of modern farming, the concept of cultivating specific crops not for harvest but for the benefit of the soil itself is gaining renewed attention. Green manure, a technique that involves planting cover crops to enhance soil health, offers a natural and environmentally friendly alternative to conventional farming practices.

The essence of green manure

Green manure, often referred to as a "living fertilizer," transcends the conventional notion of farming where every planted crop is destined for the dinner table. Instead, it embraces the idea that certain crops, strategically chosen for their unique properties, can be sown and then plowed back into the soil to fortify its structure and fertility.

Nitrogen fixation: One of the key attributes of green manure lies in its ability to fix nitrogen. Leguminous cover crops, such as clover, vetch, or peas, form symbiotic relationships with nitrogen-fixing bacteria. This biological alchemy converts atmospheric nitrogen into a form usable by plants, enriching the soil naturally and reducing the need for synthetic nitrogen fertilizers.

Organic matter enrichment: As green manure crops grow, they accumulate biomass. When this biomass is later incorporated into the soil, it acts as a valuable source of organic matter. This process improves soil structure, enhances water retention, and promotes a healthy environment for beneficial microorganisms.

Erosion control: The extensive root systems of many green manure crops provide an effective defense against soil erosion. In regions prone to erosion, this living armor stabilizes the topsoil, preventing nutrient loss and maintaining the integrity of the agricultural landscape.

Weed suppression: The vigorous growth of green manure crops shades the soil, suppressing weed growth. This natural weed control not only reduces the competition for nutrients but also

diminishes the reliance on herbicides, contributing to a more sustainable and eco-friendly farming system.

Benefits of green manure

Cost-effective fertilization: Green manure is a cost-effective alternative to commercial fertilizers. By harnessing the nitrogen-fixing capabilities of specific crops, farmers can reduce their dependence on costly synthetic inputs, resulting in economic savings and promoting sustainable agricultural practices.

Crop rotation and disease suppression: Integrating green manure into a crop rotation plan disrupts the life cycles of pests and diseases. Different cover crops attract different pests, preventing the buildup of specific pathogens and reducing the need for chemical interventions.

Improved water management: The organic matter incorporated through green manure enhances soil water retention capacity. This is particularly valuable in regions facing erratic rainfall patterns, as improved water management contributes to the resilience of crops during dry periods.

Enhanced biodiversity: Green manure fosters biodiversity in the soil by creating a habitat for beneficial microorganisms. This microbial diversity contributes to nutrient cycling, disease suppression, and overall soil health.

Practical application of green manure

Choose cover crops wisely: The success of green manure hinges on selecting cover crops that align with the specific needs of the soil and the subsequent cash crops. Consider factors such as nitrogen requirements, climate, and soil type when choosing cover crops.

Implement thoughtful crop rotation: Integrate green manure crops into a well-designed crop rotation plan. Rotate crops strategically to optimize nutrient availability, disrupt pest cycles, and enhance overall soil health.

Time incorporation appropriately: Timing is crucial when incorporating green manure crops into the soil. Generally, it is

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done before the cover crops flower and set seed, ensuring that the nutrients are released at the right stage for subsequent crops.

Adapt to local conditions: Tailor green manure practices to local climate and soil conditions. Different regions may benefit

from specific cover crops, and adjusting planting and the incorporation times can optimize results.