

MINECROP: Integration of animals into cropping systems

About

In recent decades, animals and crops have often been treated as separate elements within agricultural systems, but reintegrating them can unlock substantial environmental and agricultural benefits. Integrating animals into cropping systems promotes a healthier, more **sustainable ecosystem**. Manure from grazing animals serves as a **natural fertilizer**, enriching the soil with organic matter and essential nutrients, which reduces the need for synthetic inputs. Grazing animals also contribute to soil health by returning nutrients through crop residues and cover crops, improving soil structure, increasing water retention, and fostering beneficial microbial activity—all essential for productive, long-term crop yields. Additionally, animals play a natural role in **pest and weed management**, helping to minimize chemical inputs. Integrating animals further enhances biodiversity, creating resilient agricultural systems that better withstand climate challenges while supporting the natural behaviors and welfare of animals.

Practical use

Integrated animal-cropping systems rely on practices like **rotational grazing** and **cover cropping** to maintain soil fertility and promote sustainable agriculture. In rotational grazing, livestock are moved between fields to prevent overgrazing, allowing fields to recover and benefiting the soil with organic matter and nutrients from animal manure. Cover crops, such as clover or rye, serve as forage for animals and help maintain soil health by naturally adding nutrients. Techniques like **silvopasture** and **agroforestry**, which incorporate trees into grazing areas, further enhance biodiversity, provide shade, and create varied foraging options for livestock.

These systems require careful planning, including infrastructure investments like fencing and clean water sources, to support livestock health and efficient grazing. Manure management also plays a key role, as composting converts waste into valuable organic fertilizer, reducing the need for synthetic inputs. Though initial costs may be higher, integrated systems save money over time by lowering reliance on fertilizers and pesticides, while products from these systems often command higher market prices due to their sustainable practices. Overall, integrated farms build resilience, promote biodiversity, and create a more adaptable farming system.

Examples

One notable example of integrated animal-cropping is *Ferme du Bec Hellouin* in Normandy, which combines organic vegetable production with poultry in a permaculture system. Chickens roam designated sections, foraging for pests like slugs and insects, reducing the need for chemical pesticides. Their manure enriches the soil with nitrogen and organic matter, enhancing fertility and promoting healthy crop growth. This balanced approach aligns with agroecological principles and demonstrates how diversified small-scale farming can be both sustainable and profitable. As an educational model, the farm showcases effective methods to build resilient, productive farming systems.

Another excellent example is *Dehesa San Francisco* in Andalusia, which uses a traditional Dehesa agroforestry system integrating Iberian pigs and sheep into oak woodlands. The animals graze on native grasses and acorns, managing vegetation and reducing wildfire risks. Pigs contribute to nutrient cycling by breaking down acorns, while sheep naturally fertilize the soil with organic matter. This model preserves biodiversity, sustains soil health, and produces high-quality foods, like Iberian ham, exemplifying how traditional systems can be adapted to meet modern sustainable agriculture needs.

Knuthenlund Estate on the Danish island of Lolland is a leader in large-scale organic farming, integrating dairy cows and sheep with crop production. The estate practices rotational grazing on cover crops like clover and rye, which fertilizes the soil naturally and improves crop health. Sheep also manage vegetation on fallow land, reducing soil erosion and increasing biodiversity through varied grazing areas and plant species. Known for premium organic dairy products and lamb, Knuthenlund Estate meets the demand for sustainable foods while ensuring high welfare standards for its pasture-raised animals.

Resources

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