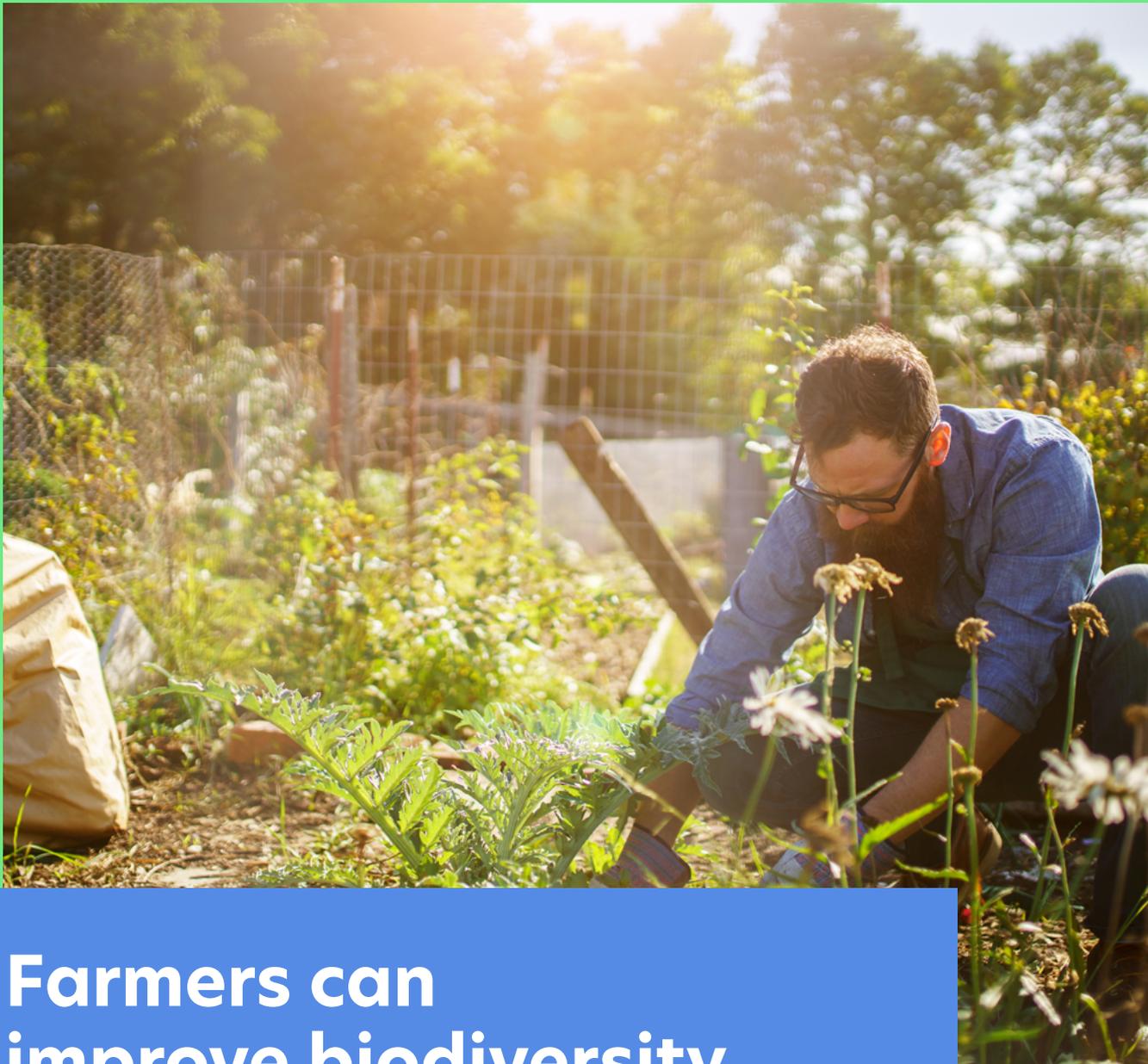


Focus on biodiversity

A series of articles addressing the importance of biodiversity in agriculture. Farming for a better future.



Farmers can improve biodiversity

Productive, biodiverse agriculture is in the farmer's hands

Most important asset

Agricultural soils are the farmer's most important asset. Maintaining healthy soil is essential to feeding our growing world population, to mitigating climate change and to successful, productive farming. Unfortunately, a large percentage of agricultural soils around the world are degraded, but they can be improved through regenerative farming methods that increase biodiversity. Institutions such as the Food and Agricultural Organization of the United Nations indicate the importance of biodiversity for productive, sustainable and resilient farming.

Many aspects that influence farming, such as the weather and market prices, are beyond the farmer's direct control. But that is not the case with biodiversity. Farmers can take action to improve plant diversity by applying regenerative farming techniques that help increase soil biota. Later in this article, we explore two concrete ways that farmers can increase the biodiversity of their production systems. First, crop rotations that reduce soil degradation. And second, collective grazing of livestock. There are many more examples, but these two interventions are of special relevance for large farming operations.



Farmers can choose for high plant diversity

Increase biodiversity

In general, to increase biodiversity, farmers need to maintain high plant diversity and avoid monoculture farming, the practice of growing the same crop in the same place for many years in a row. Monocultures reduce the variety of creatures the soil can support, such as insects, microorganisms and plants. They also reduce the diversity of resources the soil can produce, such as nitrogen, potassium and phosphorus. To increase plant diversity, farmers can choose complementary cropping systems in which two or more crops are grown simultaneously and harvested together. The seeds are then separated after harvest.

Another technique to increase plant diversity is to grow crops through a living mulch of clovers. The clovers stay close to the ground while the cereal grows taller and can be harvested when ripe. This leaves the clovers undisturbed to carry on feeding the soil and fixing nitrogen. Soy, in particular, lends itself to this approach. By choosing a diversity of plants, the farmer contributes to the structure and nutrient production of the soil. This increases the available nutrients for crops and improves the resilience of the system.

Farmers lower pesticide and fertilizer use through crop rotation



Regenerative agriculture is a set of farming principles designed to rejuvenate ecosystems and enhance stocks of natural capital rather than depleting them. Earlier in this article, we promised two concrete ways farmers can increase the biodiversity of their production systems. The first is crop rotation, a regenerative approach that is particularly applicable to large farms.

As mentioned, the practice of monoculture, growing the same crop in the same place for many years in a row, has numerous disadvantages. It gradually depletes the soil of nutrients.

Also, it can create an aggressive pest and weed community, with soil that is highly dependent on toxic pesticides and expensive fertilizer.

Practice of growing different types

Crop rotation is the practice of growing different types of crops in the same area across a sequence of growing seasons. It is applied throughout the planet and shares a basic principle of rotation for diversification. For example, a farmer plants a field of corn, which consumes large amounts of nitrogen. When the corn harvest is finished, the farmer plants beans,

which return nitrogen to the soil. This practice interrupts pest and disease cycles since they are often species-based. It also improves soil health by increasing biomass from different crops' root structures.

Well-designed crop rotations increase biodiversity. They create healthier soils with improved soil structure and higher levels of organic matter. Crop rotations also reduce reliance on one set of nutrients as well as the need for synthetic fertilizers and herbicides.



Farmers increase biodiversity through collective livestock grazing

Careful crop management is one-way farmers can increase biodiversity. Another way is careful livestock management, and in particular collective grazing, in which animals graze and move in groups every few days. Also referred to as mob grazing or holistic management, collective grazing is characterized by short-duration, high-density grazing with a longer than usual grass recovery period. Collective grazing brings far-reaching benefits to both the animals and the environment.

Natural grass species are maintained

Thanks to the short grazing duration in a given space, the cattle eat only about one-third of the available grass. They trample and leave behind what is not eaten. With longer-duration grazing, the lawn must be reseeded, which means one plant will become dominant. With short-duration grazing, the various natural grass species are maintained, so it is unlikely that one plant will become dominant. Further, the trampled forage returns to the soil surface as organic matter, helping feed the soil. Longer periods between grazing allow grasslands to grow taller, resulting in stronger, deeper roots and greater plant diversity, which attracts pollinators and seed dispersers. Ruminants such as cows naturally trample the soil, breaking it up to allow in moisture and seeds. Further, the manure spreads more evenly as the herd moves through the field.

Collective livestock grazing also improves animal welfare. Poorly maintained animals may not achieve their full productive potential. Holistic management can adopt more sustainable farming practices that improve animal welfare as well as biodiversity, and soil and water management. Livestock maintained under these conditions can be differentiated through specialty labels, certifications or premium categories. Consumers and participants in the value chain are increasingly appreciative of sustainable practices based on accurate information, traceability and transparency, thus rewarding the farmer's approach to biodiverse farming.

Series on biodiversity

This article is part of a series on biodiversity that addresses the following topics:

- A general introduction to biodiversity for productive, sustainable, resilient farming
- Biodiversity compliance and productive farming go hand-in-hand
- How farmers can improve the biodiversity in their production systems
- Measuring biodiversity in production systems

Recommended Reading:

The state of the world's biodiversity for food and agriculture. Food and Agriculture Organization of the United Nations, 2019.
Farm of the future: journey to net zero. Royal Agricultural Society of England, 2022.
Regenerative organic agriculture and climate change. Rodale Institute, 2020.
What is mob grazing? Soil Association Scotland.
Le programme "Leite de Vacas Felizes" aux Açores: un levier du bien-être des vaches au pâturage. Vasconcelos E, 2019.