FarmBioNet

Farmer-focused biodiversity and agricultural knowledge network

Enhancing Farmland Biodiversity through Intercropping, Polyculture and Crop Rotation

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The power of crop diversification: grow more, spend less

Growing the same crop year after year depletes soil, increases pest pressure, and raises input costs. Intercropping, polyculture, and crop rotation offer a smarter approach.

Photo credit: Darko Znaor

Intercropping involves growing two or more crops simultaneously in deliberate spatial arrangements. Polyculture cultivates multiple species in the same area. Crop rotation means sequentially planting different crops on the same field over time. Together, these practices address biodiversity decline while maintaining productive agriculture.

Research confirms substantial benefits. Intercropping produces on average 1.5 tonnes more grain per hectare than sole-crop yields. Rotation with legumes increases subsequent yields by 20% globally. A synthesis of over 5,000 studies found diversification enhances biodiversity, pollination, pest control, and soil fertility while maintaining yields. A further study across 120 crop species in 85 countries found diversification boosts production by 14%, biodiversity by 24%, pest control by 63%, water quality by 51%, and soil quality by 11%.

Practical recommendations

- Include flowering crops (legumes, oilseeds) in rotations to support pollinators and beneficial insects.
- Use cereal-legume intercropping (wheat-faba bean, maize-soybean) to enhance biodiversity.
- Extend rotation length to 4–5 years minimum, including crops from different plant families (be aware of legume fatigue, include once in rotation).
- Retain crop residues to provide habitat for invertebrates and soil organisms.
- Reduce or avoid pesticides, as natural pest regulation often makes them unnecessary.
- Include crops of different rooting depths in your rotation.

Further Information on farmbionet.eu

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