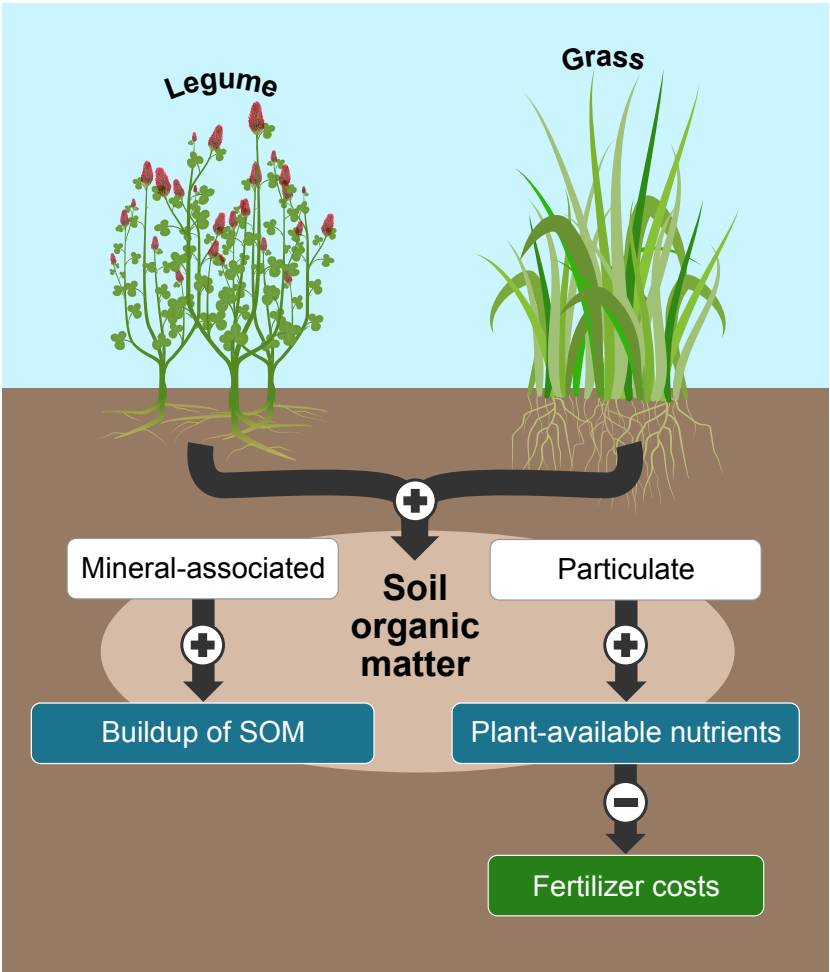


# How Cover Crops Build Soil Organic Matter

Cover crops increase soil organic matter (SOM), but different portions of SOM provide unique benefits (see *diagram*). In a greenhouse study using ten different soil types, we grew cereal rye-crimson clover mixtures and quantified how much carbon those cover crops put into the two different portions of SOM.



Legume and grass cover crops put carbon into both portions of SOM. Increasing mineral-associated organic matter (MAOM) is important for long-term carbon sequestration. Particulate organic matter (POM) is an important nutrient resource for crops. Building up POM is important for decreasing on-farm fertilizer costs.

## Two Portions of SOM

**Mineral-Associated Organic Matter (MAOM)** is like a savings account. It is produced through microbial activity, gets stuck to clay particles, and stays in the soil for a long time.

**Particulate Organic Matter (POM)** is like a checking account. Soil microbes break it down to release the nutrients trapped inside. Crops can take advantage of the nutrients released from POM.

## Key Takeaways

- A rye-clover mixture boosts soil organic matter as much as rye planted alone.
- Greater cover crop biomass equals more carbon belowground.
- Cover crops are more productive in fertile soil with active microbial communities. Since cover crops build up soil organic matter, this means that the soil carbon benefits of cover crops increase with repeated use.

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