

Benefits of Soil Carbon



Biomass crops accumulate relatively large quantities of below and above ground biomass which is made of carbon **sequestered** from the atmosphere.

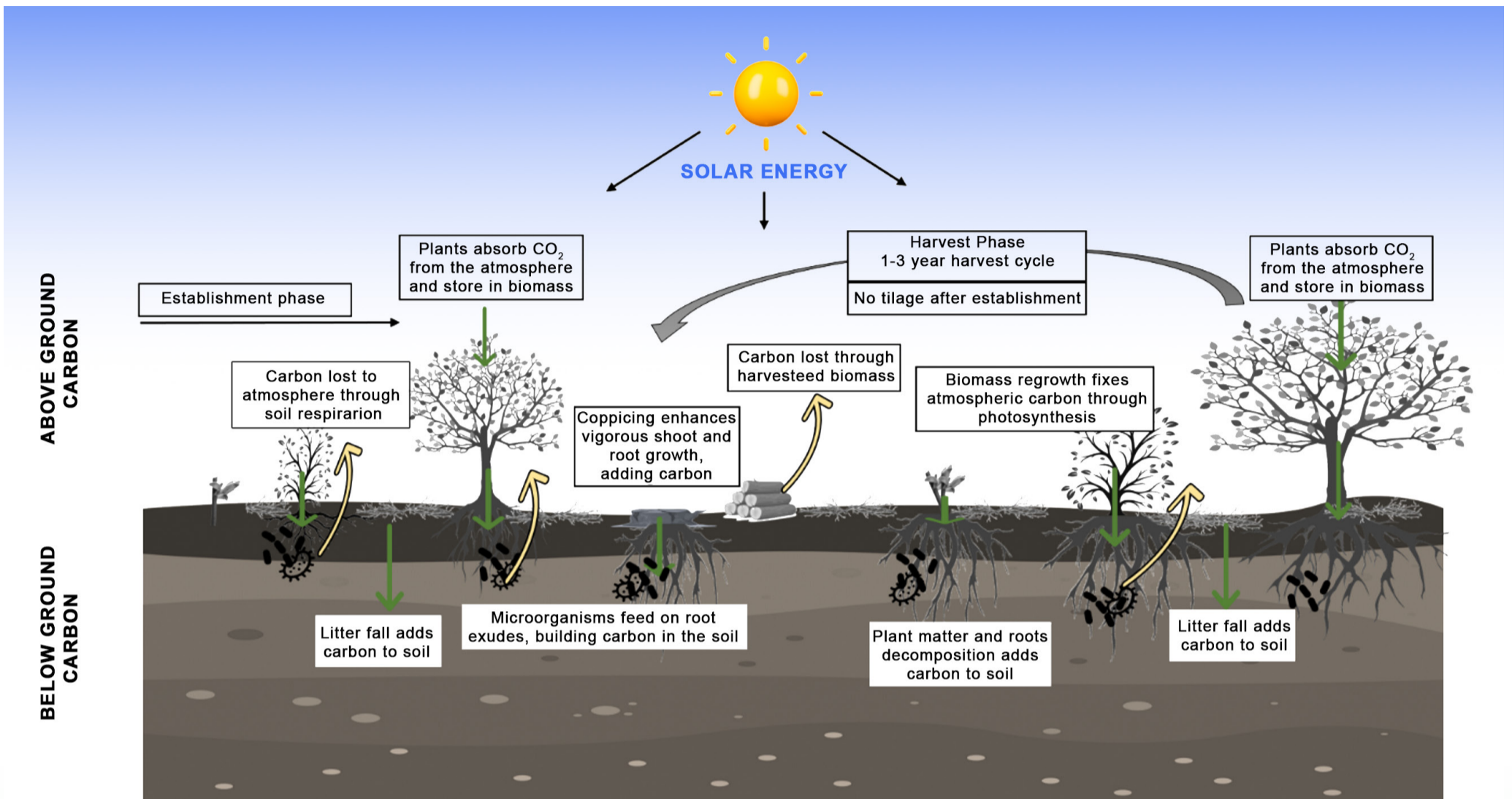


The **frequent harvest** of above ground biomass enhances vigorous shoot regeneration and root turnover, which enhances soil carbon stock.



Biomass crops after establishment, require no tillage during the lifetime of the plant, which enhances soil carbon stock by **minimising disturbance** to the soil.

CARBON TRANSFER BETWEEN THE ATMOSPHERE, BIOMASS CROPS AND SOIL



The diagram shows how carbon is transferred between the atmosphere, biomass crops and soil.

Soil organic carbon is formed from the interaction of ecosystem processes such as photosynthesis, respiration, and decomposition of soil organic matter. During photosynthesis, light energy is captured by plants and used to convert carbon dioxide (CO₂) absorbed by the plants from the air, and water from the soil, to build carbohydrates which acts as a source of food for plant growth. Atmospheric carbon fixed in the plant leaves and branches are transferred down through the roots to the soil. Plants exude carbon through their roots to feed soil microorganisms. The microorganism in the soil decomposes organic residue such as fallen leaves, branches and roots in the soil releasing carbon deep into the soil. During this process, the soil microorganisms release CO₂ into the atmosphere through respiration. The amount of carbon present in soil depends largely on the rate of decomposition of

soil organic carbon to CO₂ by microorganisms and the rate of soil organic matter input into the soil. Biomass crops have high above ground and below ground biomass which stores significant amount of carbon in the plant. Biomass crops are harvested every 1-3 years during the lifetime of the crop. The root structure of biomass crop after establishment continuously grows throughout the life cycle of the plant, storing and transferring carbon to the soil. The frequent harvest of above ground biomass enhances vigorous shoot regeneration and root turnover, which enhances soil carbon stock. Furthermore, biomass crops after establishment, requires no tillage during the lifetime of the plant, which facilitates better accumulation of soil carbon.

For these reasons, planting biomass crops could help to improve soil quality, provide resilience to physical soil degradation, and help mitigate climate change.



Planting biomass crops provide a mechanism to enhance soil carbon.