

**Trade-off between the effects of cover cropping  
on soil health factors and other ecosystem services**

Present by:

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# Outline



What is cover crop?



What is the influencing factors of cover cropping?



How cover cropping affects soil health



How cover cropping affects other ecosystem services?



What are the adaptation strategies?

## Cover Crop Definition

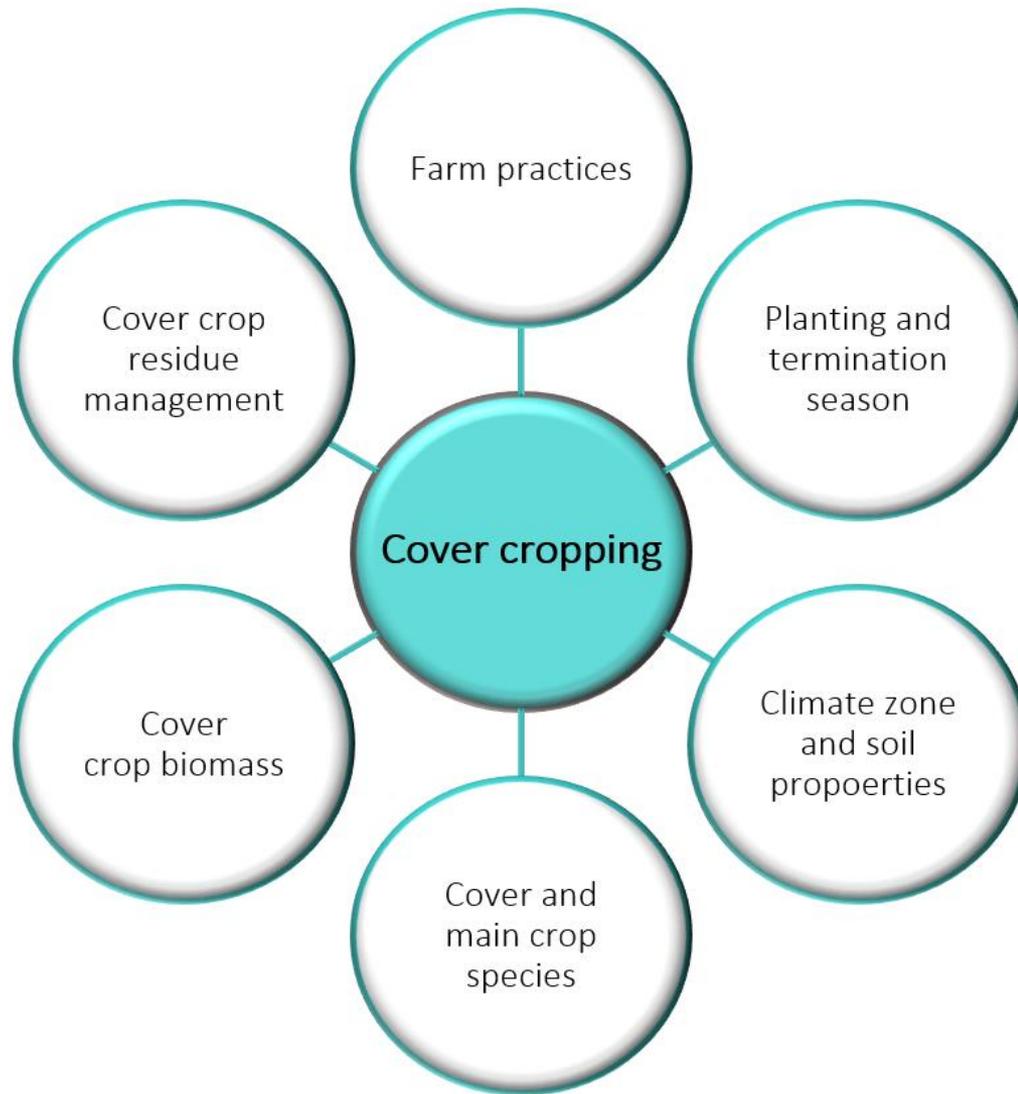
- ❖ Grasses, legumes, and forbs
- ❖ introduced into crop rotations
- ❖ for seasonal cover and conservation
- ❖ terminated by natural causes or intentionally

## Review Method

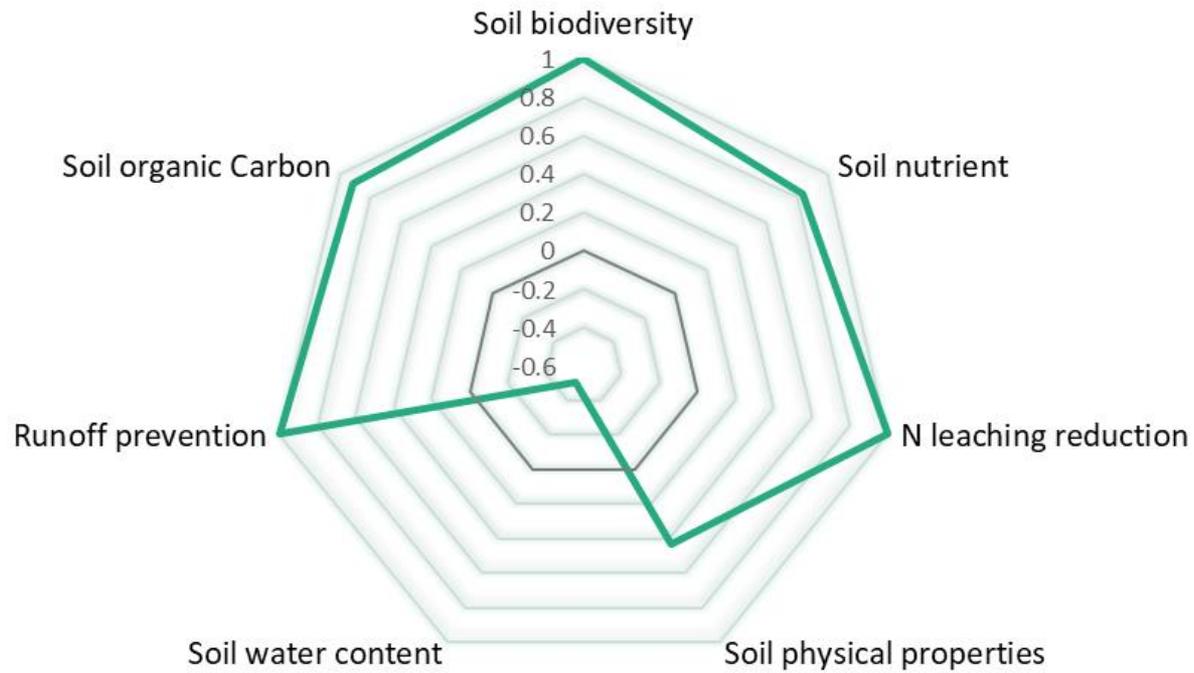
A systematic review followed by Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) was performed

- Developing a search strategy to identify related studies
- Data bases were Web of Science Core Collection and Scopus
- Screening data based on inclusion criteria (focusing on meta-analysis and reviews papers, cover cropping as intervention and sole cropping as control)
- Extracting data
- Synthesizing the results

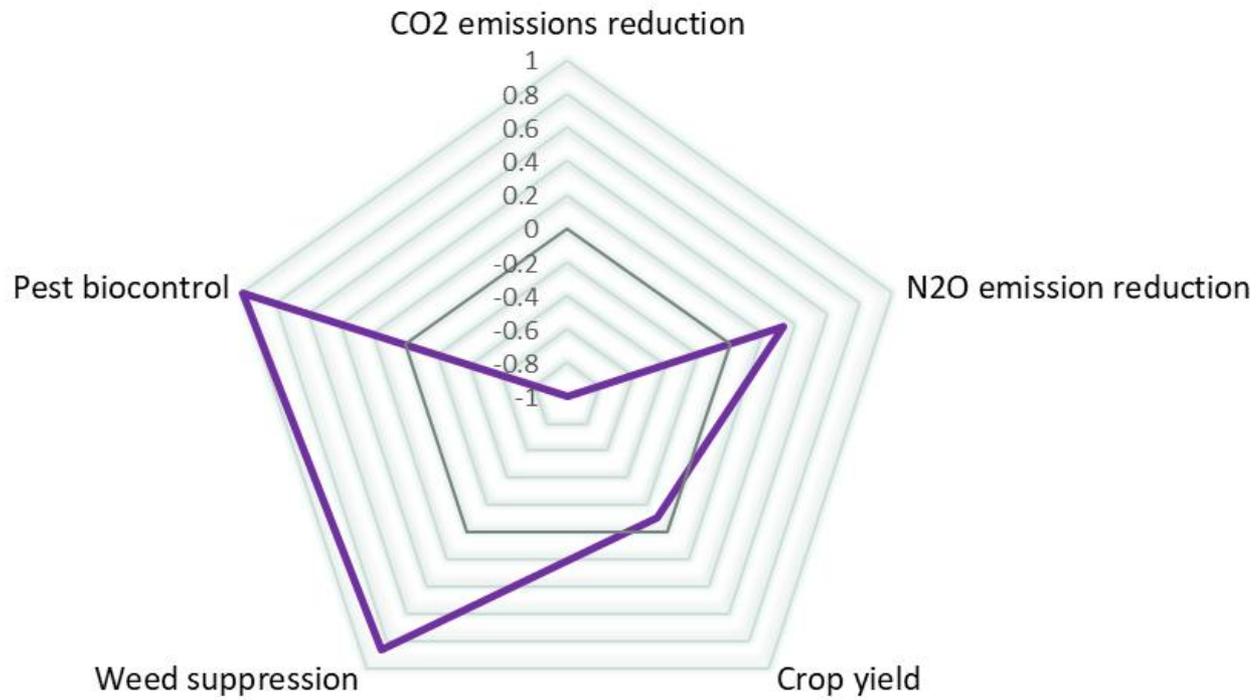




**Factors influencing the effectiveness of cover cropping**



The tradeoff between soil health parameters under CC



The tradeoff between other ecosystem services under CC

Benefits associated with type of cover crops, summarized from literature review

Effect Crop	Economics costs	Biomass production	C/N ratio	Available K	Available N	Crop Yield	NL reduction	direct N <sub>2</sub> O emissions
Legume	↑				↑	↑		↑
Non-legume		↑	↑	↑			↑	

**Note:**

This finding should be interpreted with caution and evaluated against other farming activities impacts and environmental conditions.

Therefore, growing cover crop does not increase CO<sub>2</sub> emissions content under all circumstances

or soil water content does not reduce in all geographical areas



## Cover Crop Economics

- **Direct costs:** planting, terminating, seed, and managing the cover crops
- **Indirect costs :** risk of nutrient leaching due to increased infiltration, decreased soil water, opportunity costs of time and money.
- **Direct benefits:** crop yield, soil protection, nutrient cycling and fertilizer cost savings, weed control and herbicide savings
- **Indirect benefits:** increased SOM, arbuscular mycorrhizal fungi colonization, reduced erosion, etc.



# Adaptation

**Economic:** receiving cost-share payments  
cover crops for grazing livestock or fodder

**Yield:** cover crop with less water demand  
leaving biomass on the soil  
mixture legume and non legume

**CO2 emission:** combination cover crop with no tillage  
mixture legume and non legume





Thanks for your  
attention