Farming for Carbon

Soils hold three times more carbon than all living plants on the planet!

Soils hold lots of **CARBON** in the form of **ORGANIC MATTER**

More Organic Matter → Higher CROP Yields

- **Improved nutrient cycling**
- **Water holding – less irrigation**
- **Pest control – greater biodiversity**
- **Soil structure – resistance to compaction**

- **Reduces the amount of Carbon Dioxide (a greenhouse gas) in the atmosphere**

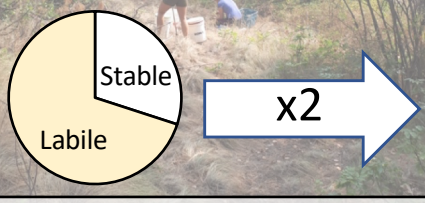
- **Does irrigated agriculture increase organic matter?**
- **Can we add more organic matter to soils?**
- **Our 5 year federally funded project set out to answer these questions…**

- We sampled 100 sites along the Okanagan Valley, and collected over 500 soil samples
- Sites included natural areas not used for agriculture, apple and cherry orchards, and vineyards
- We measured soil organic matter content to a depth of 60 cm at each site

KEY FINDINGS

- Soils under irrigated woody perennial crops have double the organic matter content compared to natural areas not used for agriculture in the Valley.
- Organic matter exists in two forms: Stable and Labile Organic Matter; agriculture doesn't change the relative proportions of these two forms.
- More organic matter is present in the drive rows rather than directly under crops and plant cover is important for organic matter formation.
- Cherry orchard soils have the most organic matter and vineyard soils the least.
- Most soils in the Okanagan Valley have capacity to hold more organic matter, but the amount of stable organic matter is limited by the soil mineral content.

Organic matter in natural areas



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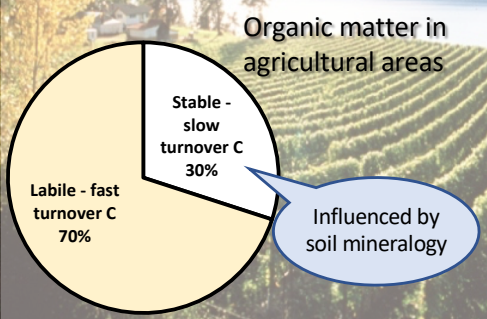
Organic matter in agricultural areas



- Stable –organic matter binds to minerals and slowly returns to the atmosphere as carbon dioxide, typically over 100 of years or even longer.
- Labile – organic matter is composed of fragments of plant litter and woody tissues; a large proportion returns to the atmosphere as carbon dioxide quickly, within a few years.

WHAT DOES THIS MEAN FOR THE GROWER?

- This is a good news story.
- Irrigated woody perennial crop production in the Okanagan Valley has increased the organic matter content of soils and in so doing improved soil health.
- Drive rows are important for organic matter storage and should be planted whenever practical.
- Further increases in soil organic matter content are possible by minimizing areas with no plants (e.g. herbicide strips).
- Organic matter can be added to soils in the form of pruning debris, grass clippings etc. BUT frequent additions are required since most of this material will not be retained by the soil in the long term.

For more information contact melanie.jones@ubc.ca

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