

CARBON MARKETS

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Disclaimer

- ➔ Carbon markets in Nebraska are currently unregulated. Nebraska ag producers are working under “voluntary” markets.
 - Regulation could significantly change this process
 - Some markets are regulated: EU, California, and Regional Greenhouse Gas Initiative (RGGI, northeastern U.S.).



What is a healthy soil?



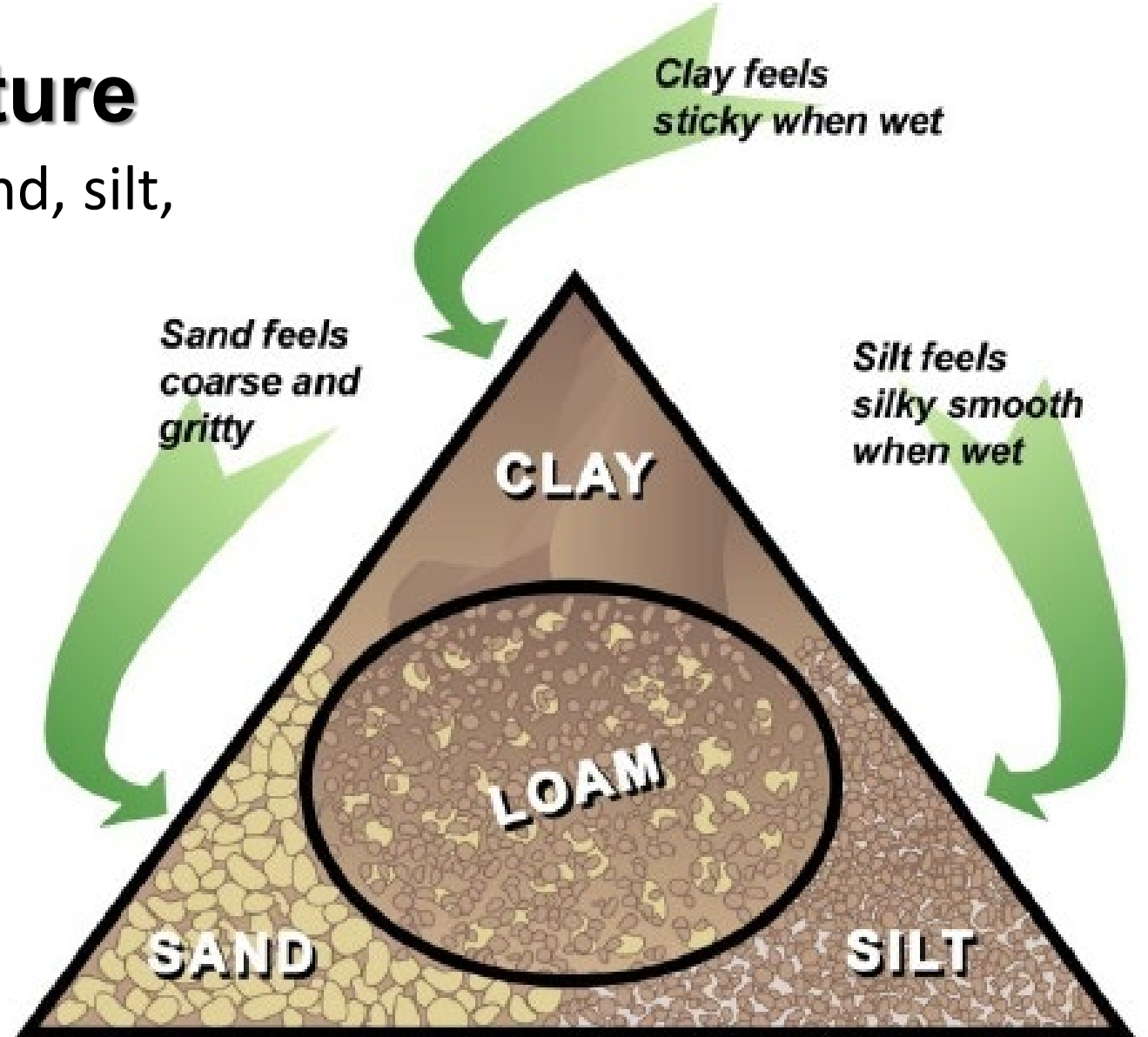
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Soil texture

Minerals sand, silt,
or clay
Usually mix

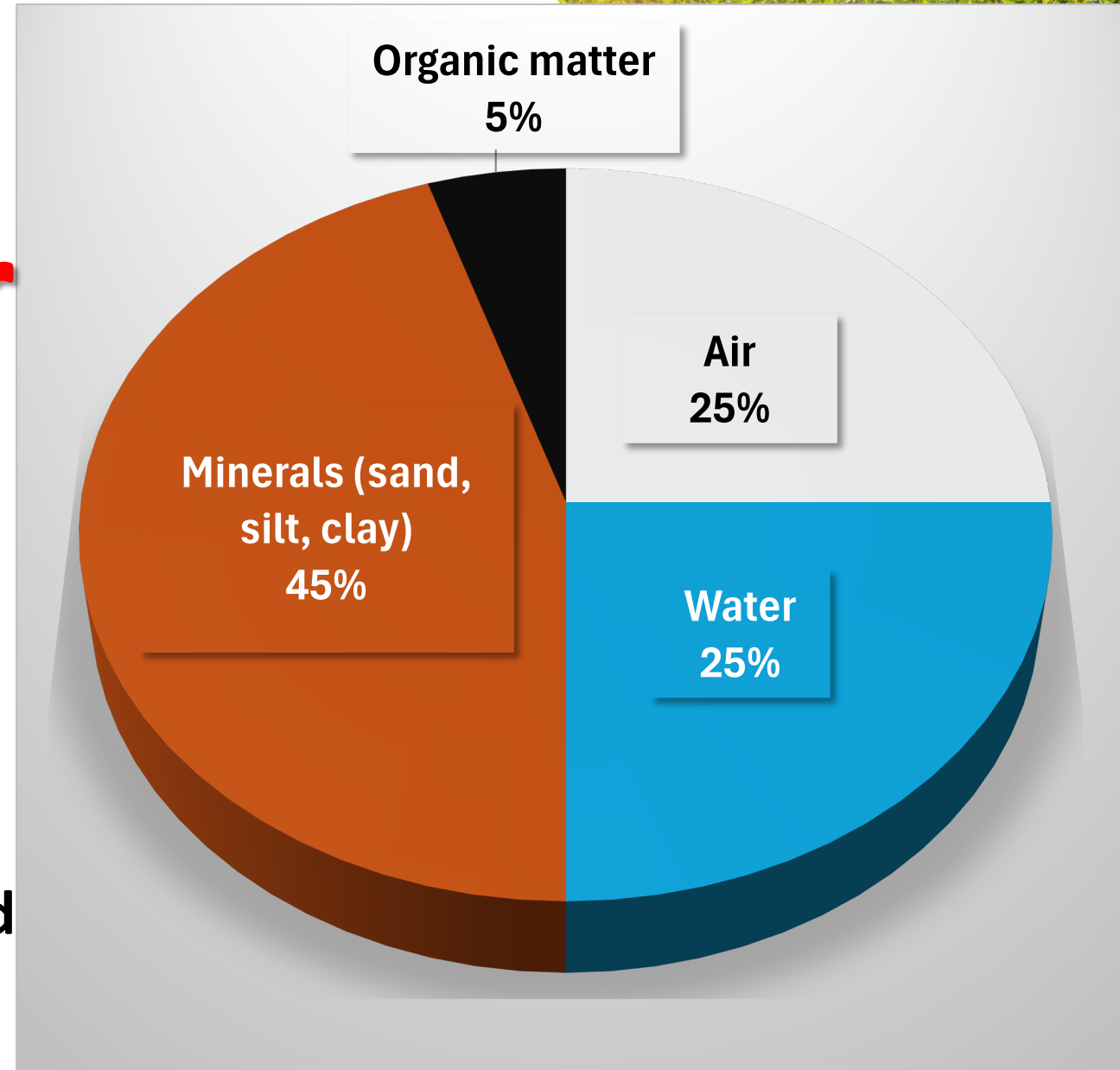


What else is in the soil?

Organic matter

- Living roots (10%) and root exudates
- Living microbes (10%)
- Dead plants, dead microbes in varying stages of decay
- Wastes from microbes, animals
- Chemically, about 58% carbon

The living, the dead, and the very dead



Organic matter is the single most important indicator of healthy soils

- Houses and feeds microbes which “recycle” its nutrients
- Makes the soil more porous, helps infiltrate and store water
- Nutrients can bind to organic matter (storage function)
- Organic matter is a “carbon sink”



Benefits of Sequestering Carbon

- ➔ Even if payments are low, farming practices that result in sequestered carbon have the benefits of:
 - Improved soil structure
 - Improved water holding capacity
 - Reduced soil erosion from water and wind
 - Improved soil health
 - Reduced nutrient loads in environment

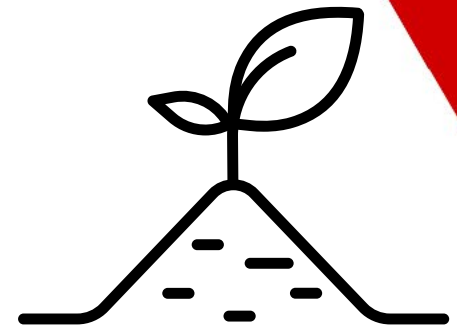


Carbon Sequestration

- ➔ Carbon sequestration = the process of capturing and storing atmospheric carbon dioxide
- ➔ Estimated that U.S. agriculture and forestry can provide **10-20%** of sequestration and emission reductions needed to reach net-zero emission by 2050

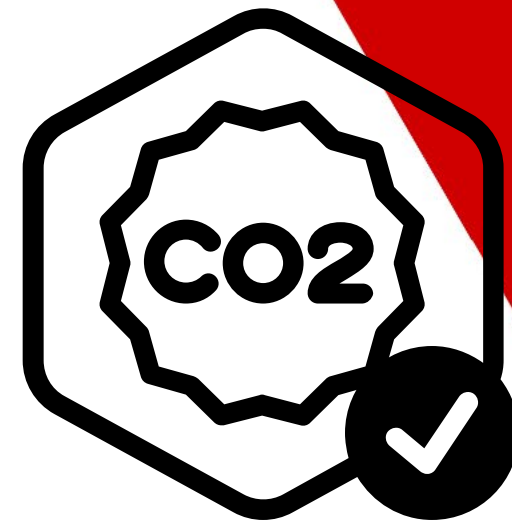


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Carbon Credits or “Offsets”

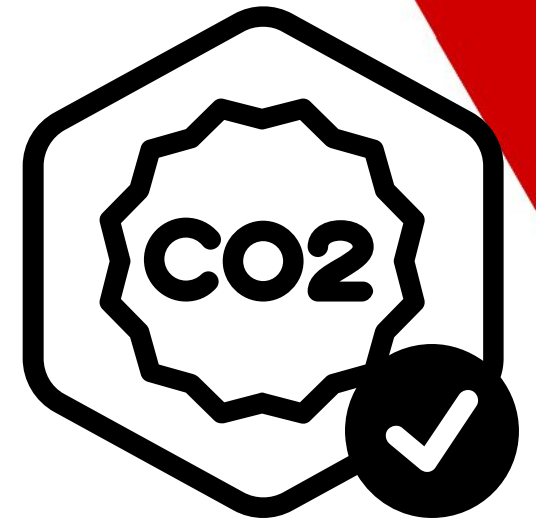
- ➔ **What are carbon credits?** a tradeable certificate representing the right to emit one metric ton of carbon dioxide (CO₂) or the equivalent amount of another greenhouse gas.
- ➔ **How many acres?** It could require 5 to 10 or more acres of cropland to generate one additional ton of sequestered carbon annually
- ➔ **What are agricultural carbon credits?** Foresters, ranchers and farmers can increase the storage of carbon from the air into the soil through improved forest, grassland and cropland practices.



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Carbon Credits or “Offsets”

- ➔ Capture and store (sequester) carbon through prescribed conservation practices
 - Cover crops, no-till or reduced tillage, diverse crop rotations, fertilizer reduction or nitrogen inhibitors, rotational grazing, land retirement
 - Many programs focus on new adoption of such practices, some may have “lookback” or vintage credits



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How Does Carbon Sequestration Take Place?

- ➔ Trapping carbon within plant material. The more vegetation that is present or the wider the window when plants are growing, the more CO₂ is potentially taken out of the air.
- ➔ Minimizing the mineralization of organic carbon already present in the soil or existing plant residue.
- ➔ Reducing soil erosion and keeping carbon trapped in the soil.



Methods of Sequestering Carbon

- ➔ Using Reduced Tillage, Strip-Till, or No-Till
- ➔ Planting Cover Crops
- ➔ Improved Fertilizer Management
- ➔ Implementing Higher Carbon Crop Rotations
- ➔ Installing Vegetated Buffers
- ➔ Converting Marginal Acres to Perennial Crops

Carbon Markets

- ➔ **Seller** – farmer, rancher, or landowner
- ➔ **Buyer** – private companies or brokers who buy carbon credits to “offset” carbon emissions

- ➔ **Aggregator** – entities who facilitate the transactions between buyers and sellers
 - Also called: project managers, owners, services providers
- ➔ **Project developers** – design and execute project
- ➔ **Third party verifiers** – validate, certify carbon credit with registry
- ➔ **Carbon registries** – develop carbon protocols and standards followed by the project.



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Verification

- ➔ Provide current and/or historical data
- ➔ Third-party verifier audits
- ➔ Not consensus on how to measure a carbon credit
 - Could require multiple soil tests to measure organic carbon and bulk density at multiple depths



How much will you be paid?

➔ It depends

- Signing bonus
- Per acre for adoption of practice
- Verified carbon capture on a per ton basis

- \$10 to \$20 per metric ton of CO₂
 - “The farmer may have to pay the fees, or the company may keep a portion of the payment or percentage of carbon credits to cover the fees, so the actual amount the farmer gets is typically less than the price listed. “



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The logo for N Extension is located in the bottom right corner. It features a large, white, outlined letter 'N' above the word 'EXTENSION' in a white, sans-serif font. The background of the logo is a red triangle that points downwards. Above the logo, there is a photograph of a cornfield with green plants under a bright sky.

When will you be paid?

- ➔ It depends, more than 1 year
 - After verification
 - Could be contingent on sale of credit



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What costs are there?

➔ It depends

- Expense of implementation
 - Seed, equipment, data collection and data management
- Verification expenses such as third-party audits or soil analysis
- Penalties for not meeting contract specifications



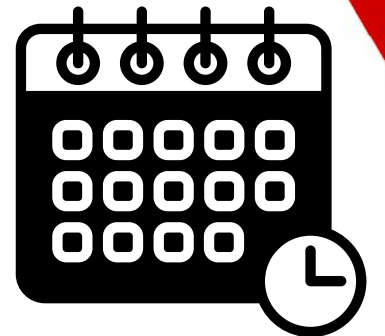
How long is the contract?

➔ It depends

- Ag related contracts 10-20 years
- Creates challenges for rented land



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What contract clauses should I be aware of?

- ➔ There are no “standard” contracts
- ➔ Minimum acreages
- ➔ Contract termination
- ➔ Penalties
- ➔ Limits on number of credits
- ➔ Right to file a lien on the land as security for contract performance, and to secure payment of any penalties for contract nonperformance



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Coming soon...

- ➔ Listing from USDA of entities that provide carbon credit opportunities
 - <https://www.usda.gov/oce/energy-and-environment/markets/carbon>
 - <https://comet-farm.com/>
- ➔ United Nations working on international carbon market
- ➔ US Securities & Exchange Commission proposing new requirements regarding “carbon friendly” claims and reporting requirements



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QUESTIONS



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Can you generate carbon credits on leased land?

- ➔ **Are there issues with generating carbon credits on leased land?**
- ➔ Issue may not be nearly as great for forests or grasslands.
- ➔ Shorter contracts may be available depending upon the market.
- ➔ Most Nebraska farm leases are handshake agreements for one year without a written lease.
- ➔ Most written leases are for one year also with specified renewal provisions.
- ➔ If ag carbon markets become a significant source of farm income, will more farm leases be written for a longer term to qualify for carbon market participation?
 - Will provision change in leases to require prospective tenants to comply with certain production requirements?
 - This would be a dramatic change from traditional norms, but this might happen if the carbon market financial incentives justify making the change.

Source: Dave Aiken, Cornhusker Economics: Ag Carbon Credits (2021)

