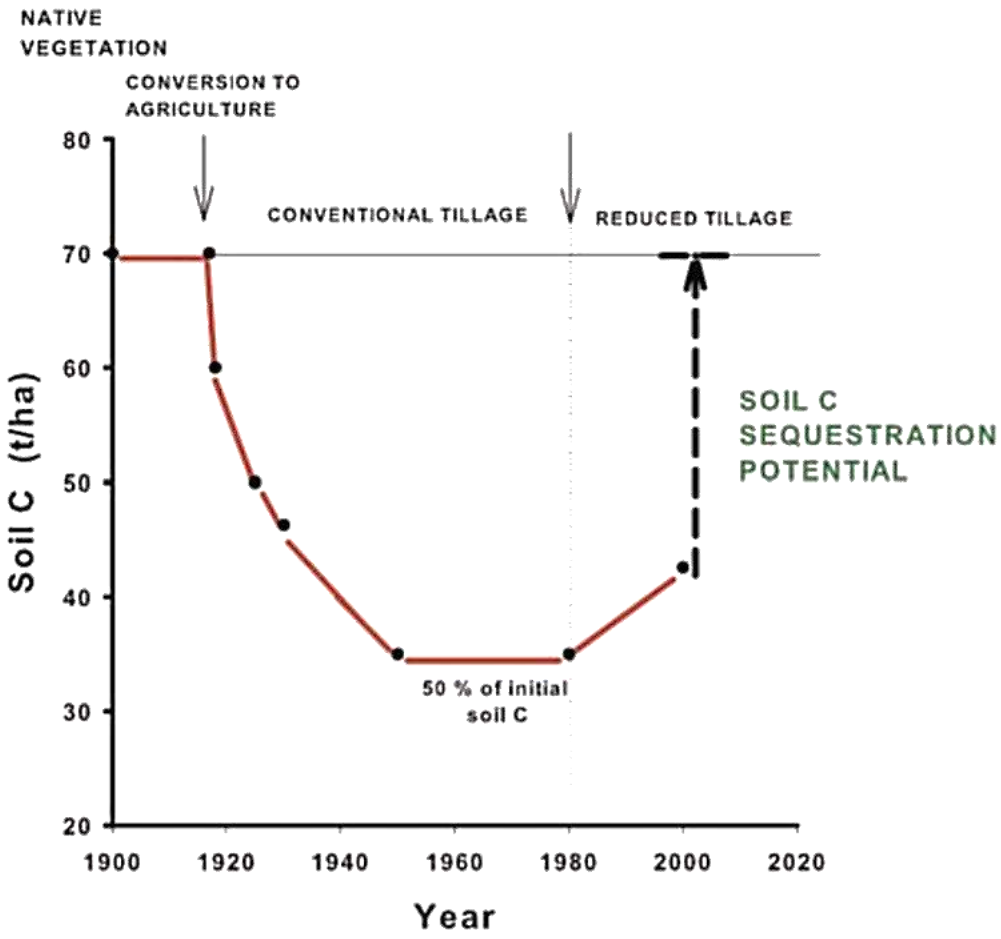
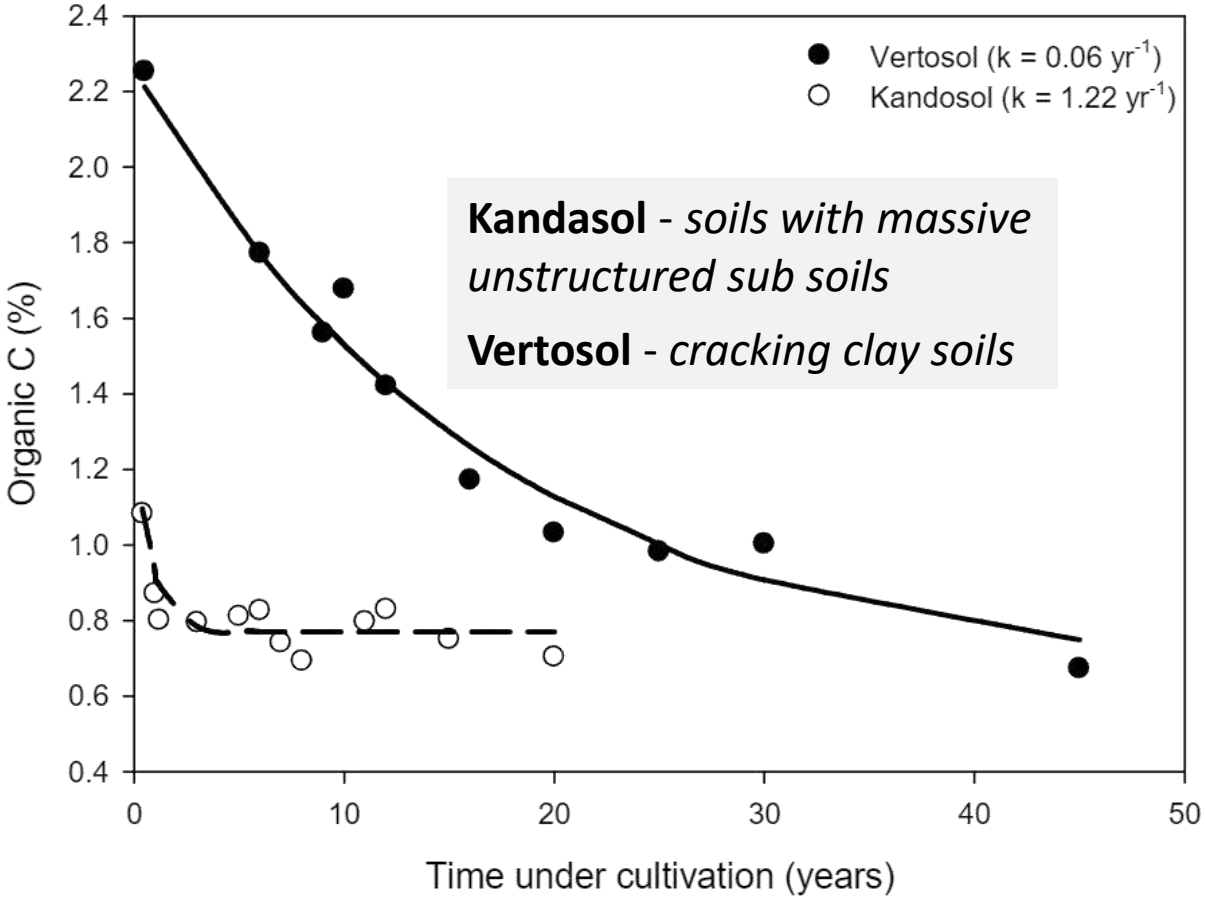
- A long and proud history of understanding our soils
- **Where are we now?**
- What is the national opportunity in soils?
  - In regenerative agriculture?
  - In negative emissions?
  - And do we separate the two?



Source: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/210756/Increasing-soil-organic-carbon.pdf

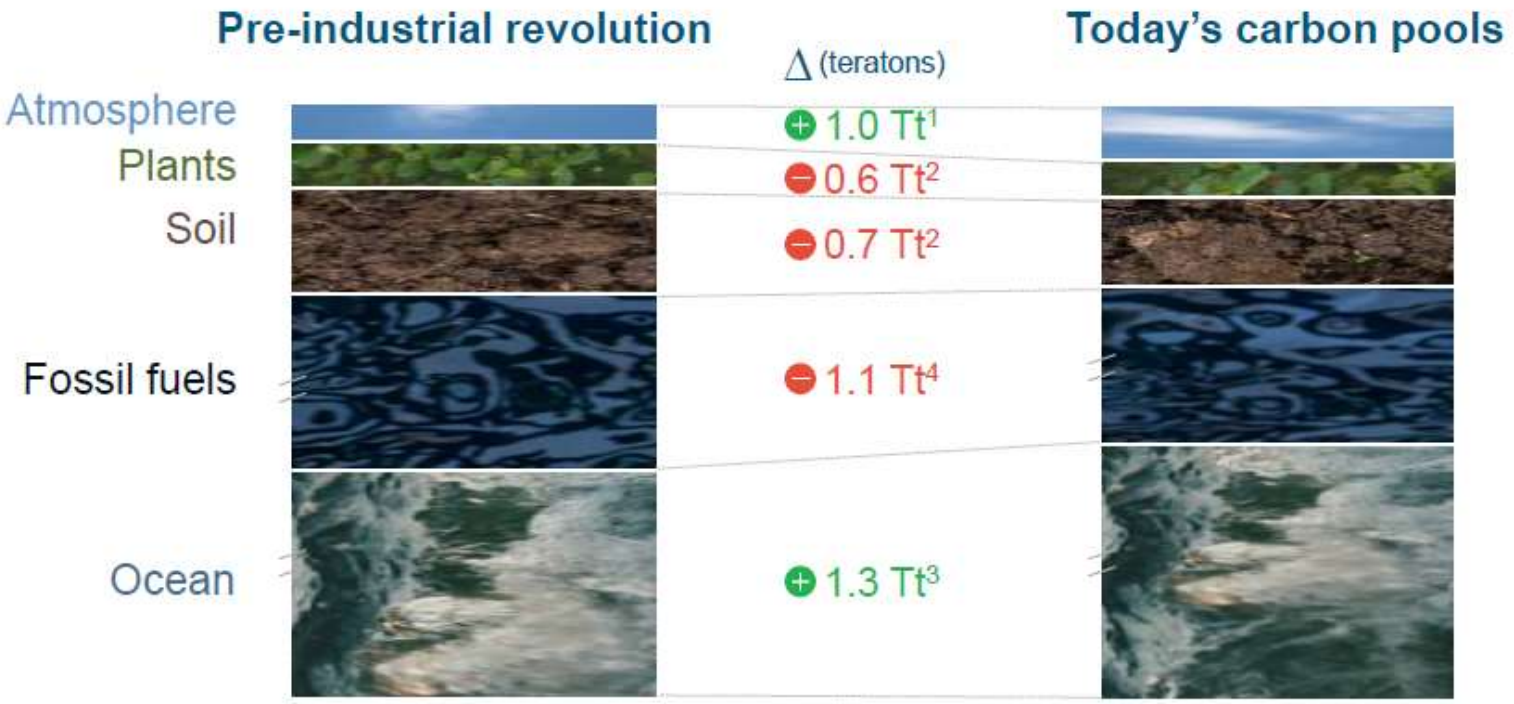
All soils are not the same



Globally in the last 200-250 years, SOC has gone from 4-5% in cropping and pasture land to 1-2% **AND IS STILL FALLING. This is not sustainable.**

Source: https://www.researchgate.net/publication/283266194_Soil_Carbon_Sequestration_Potential_A_review_for_Australian_agriculture

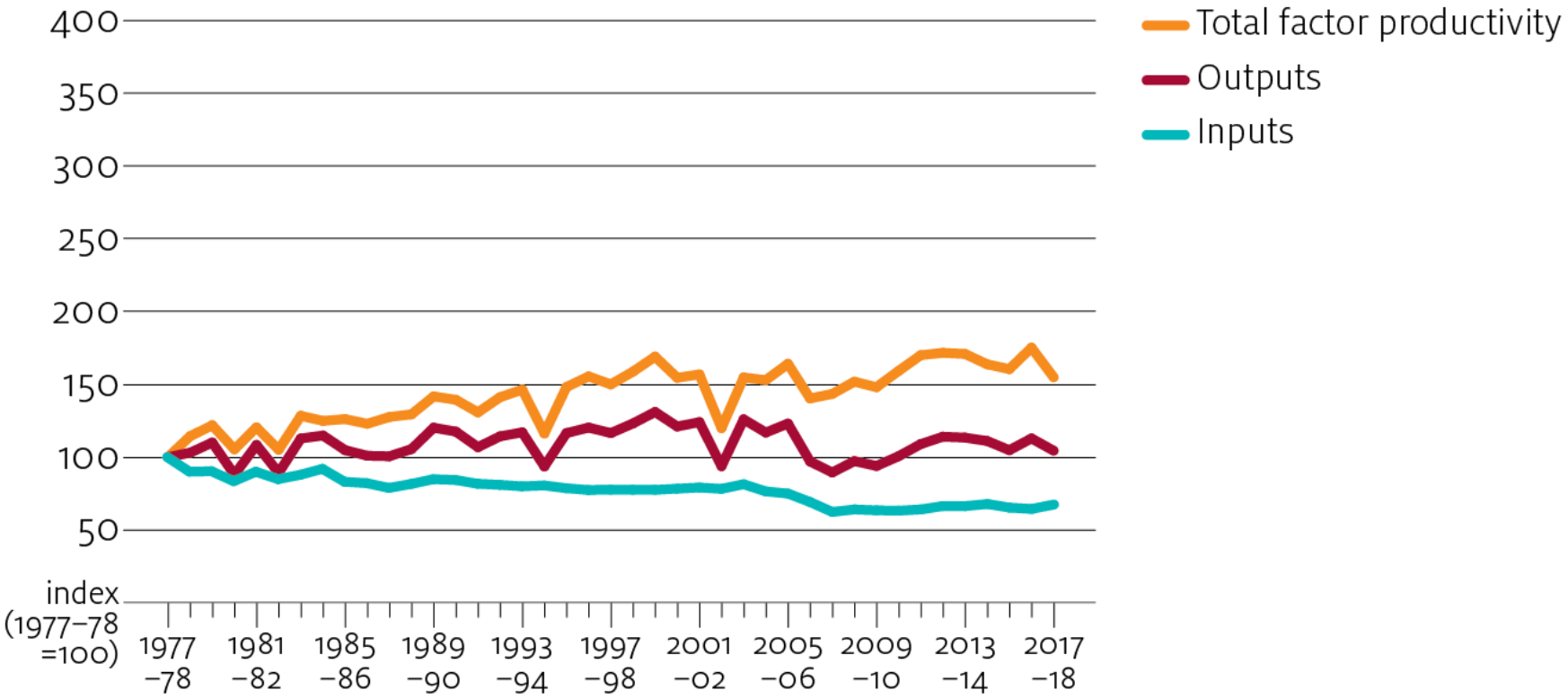
In the past ~million years, 2.3T tCO2 has come out of the earth and gone into our air and our water systems



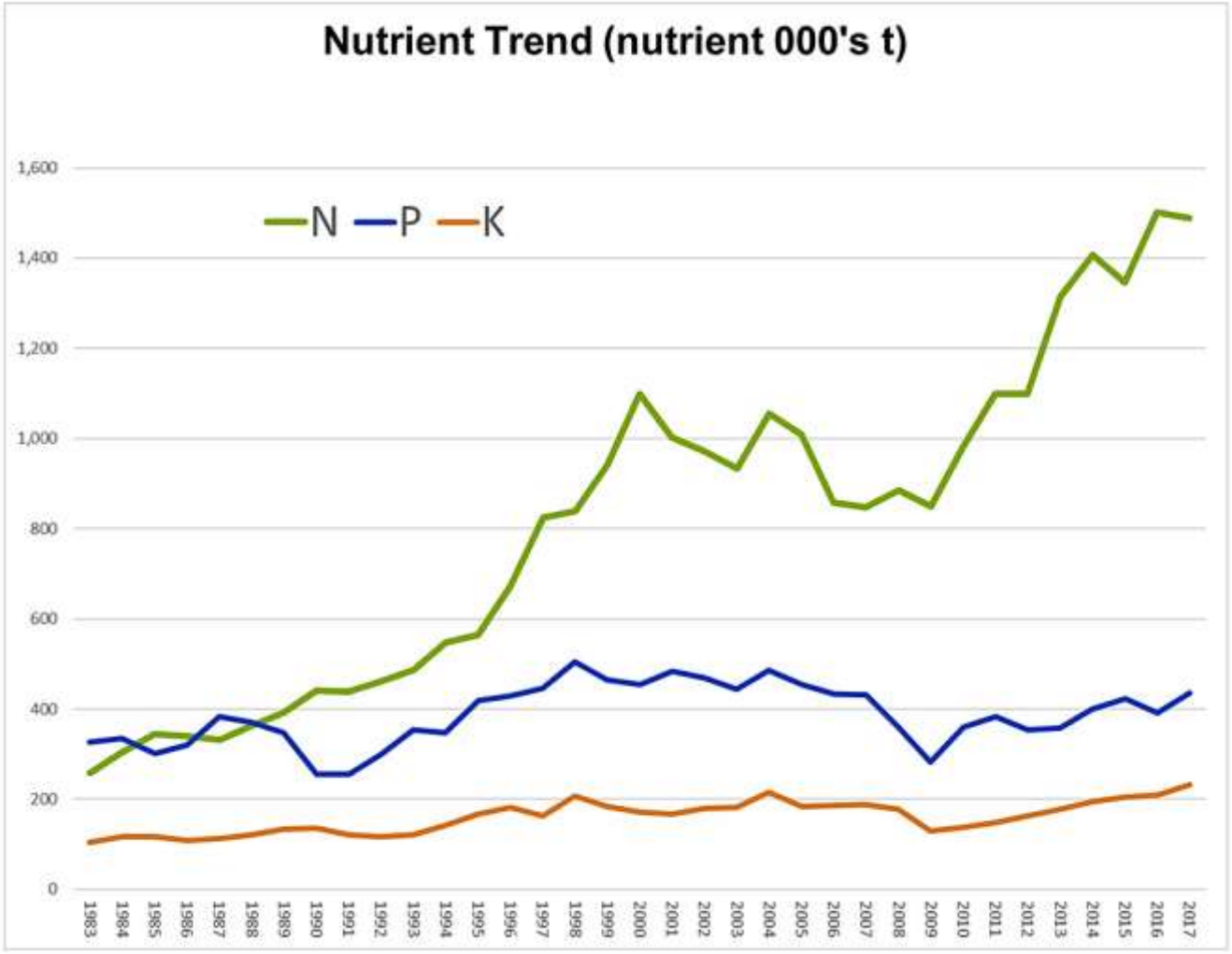
Source: 1. https://scripps.ucsd.edu/programs/keelingcurve/ ;
2. http://www.jswconline.org/content/73/6/145A.full.pdf ;
4. Residual calculated based on changes from other C stocks;
5. Eric Toensmei Solution

Productivity is not increasing

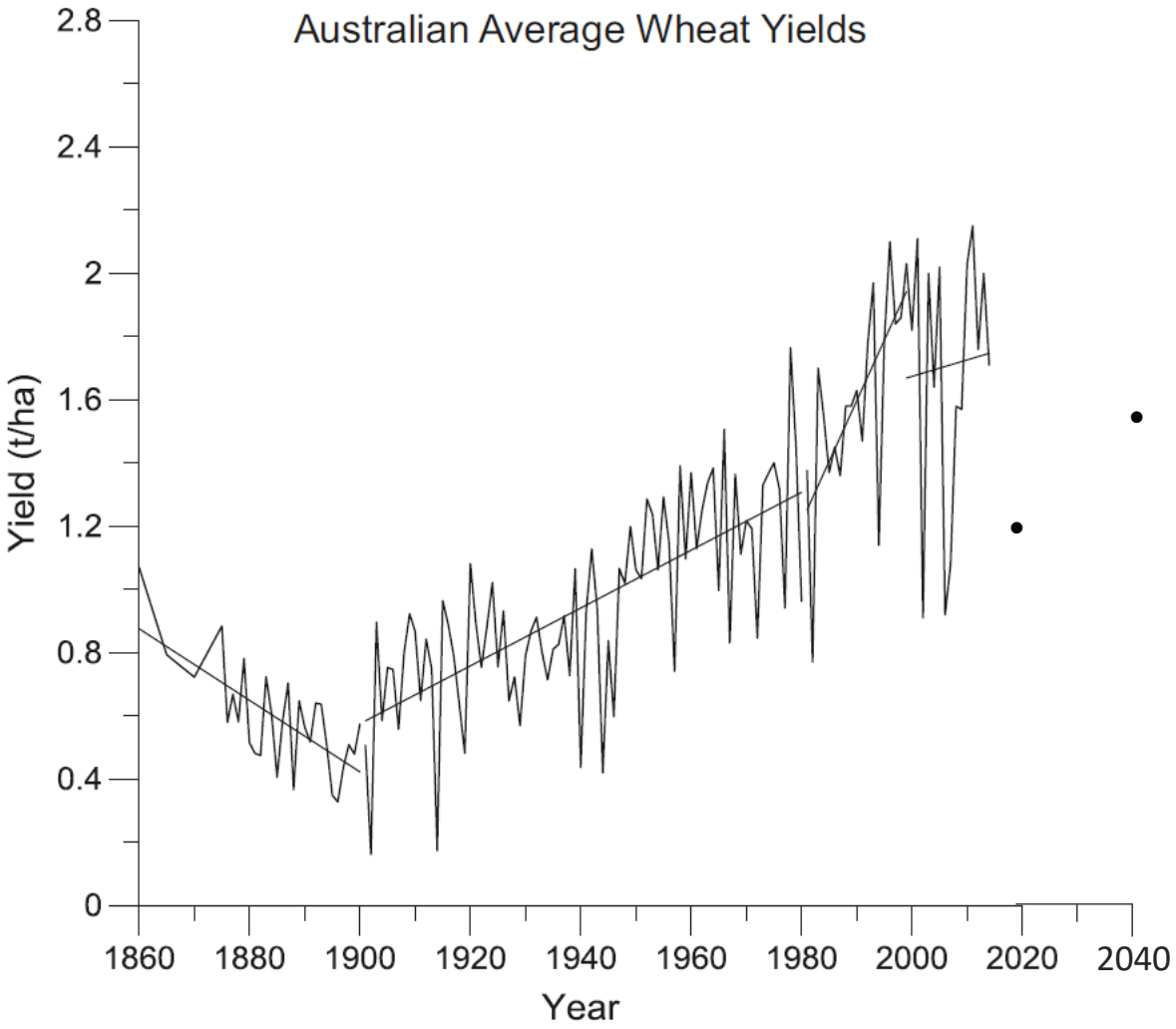
Total factor productivity, output and input, all broadacre industries, Australia
1977–78 to 2017–18



Source: ABARES Australian Agricultural and Grazing Industries Survey
https://www.agriculture.gov.au/abares/research-topics/productivity/agricultural-productivity-estimates#broadacre-productivity



Source: https://www.fertilizer.org.au/Fertilizer-Industry/Use-Trends



Sources:

- Anderson W.K., Stephens D., Siddique K.H.M. (2016) Dryland Agriculture in Australia: Experiences and Innovations. In: Farooq M., Siddique K. (eds) Innovations in Dryland Agriculture. Springer, Cham
- CSIRO-Australia wide Graincast™ wheat yield forecast, 1 December 2019. https://research.csiro.au/graincast/wheat-yield-forecasts/
- The Conversation: Changing climate has stalled Australian wheat yields: study. https://theconversation.com/changing-climate-has-stalled-australian-wheat-yields-study-71411

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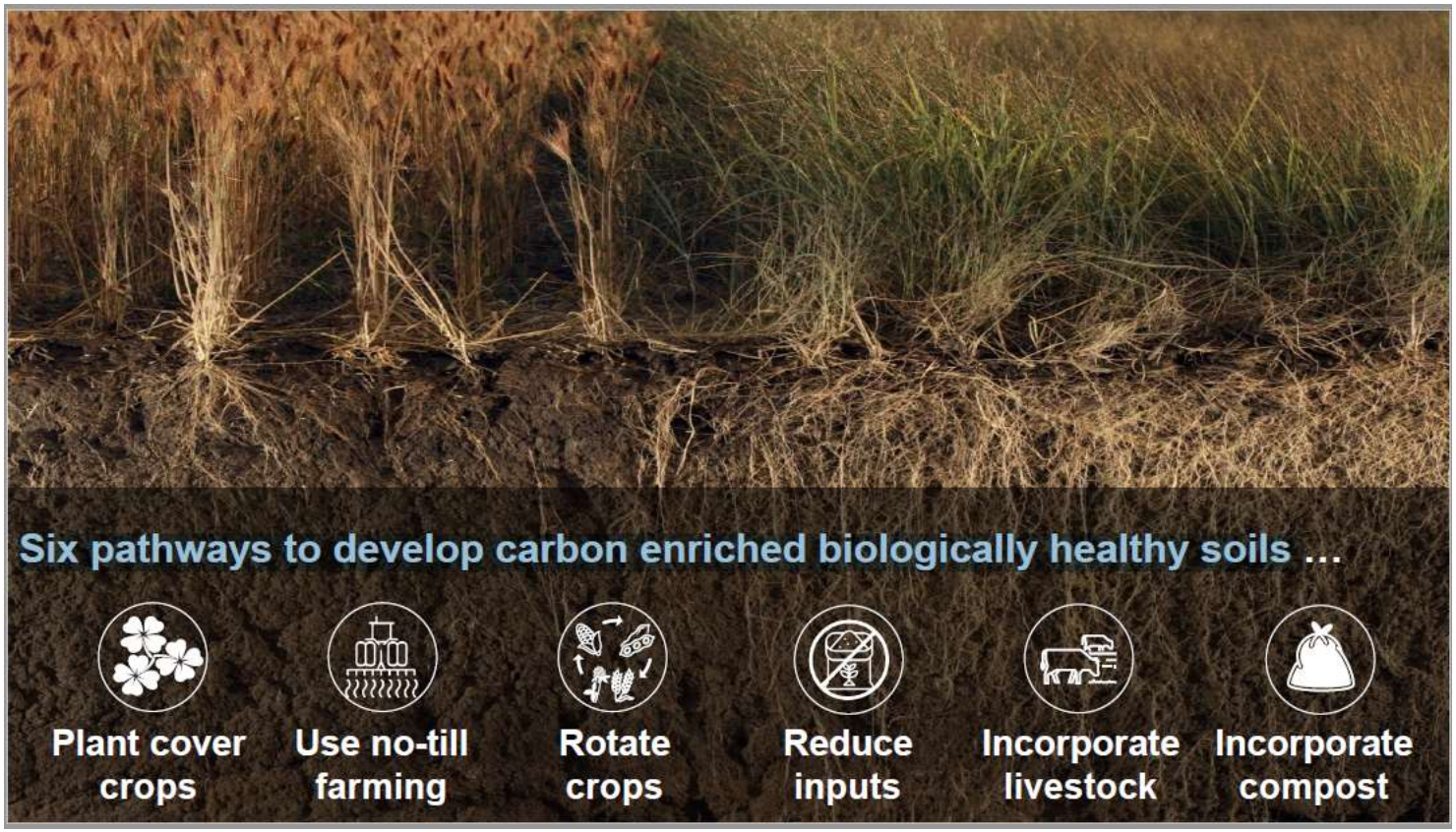
Six pathways to develop carbon enriched biologically healthy soils …
Plant cover crops
Use no-till farming
Rotate crops
Reduce inputs
Incorporate livestock
Incorporate compost