

Långliggande försök visar hur jordbruket kan rädda klimatet

Ekologiskt kretsloppsjordbruk

Ecologic Recycling Agriculture (ERA)



Artur Granstedt

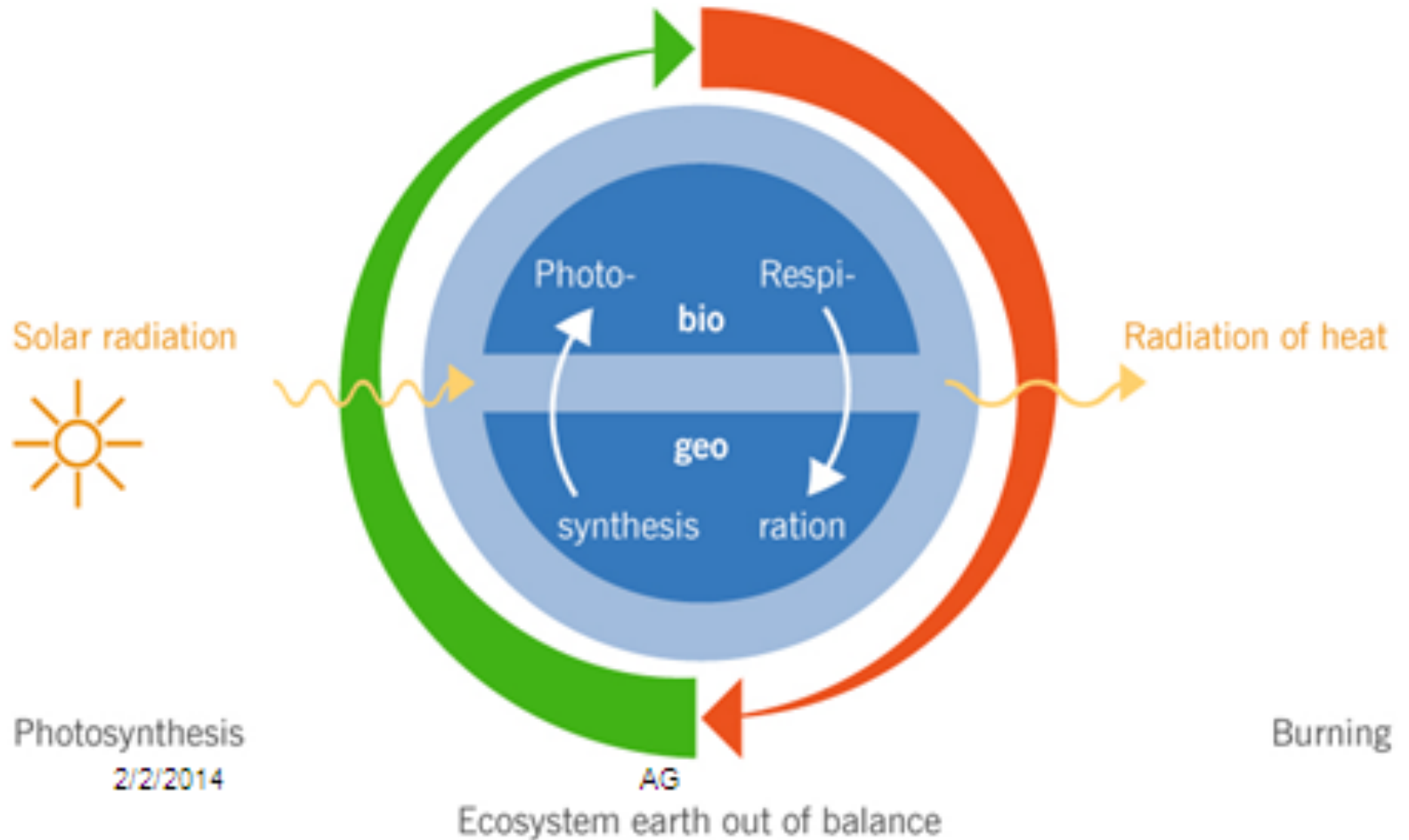
3/15/2016

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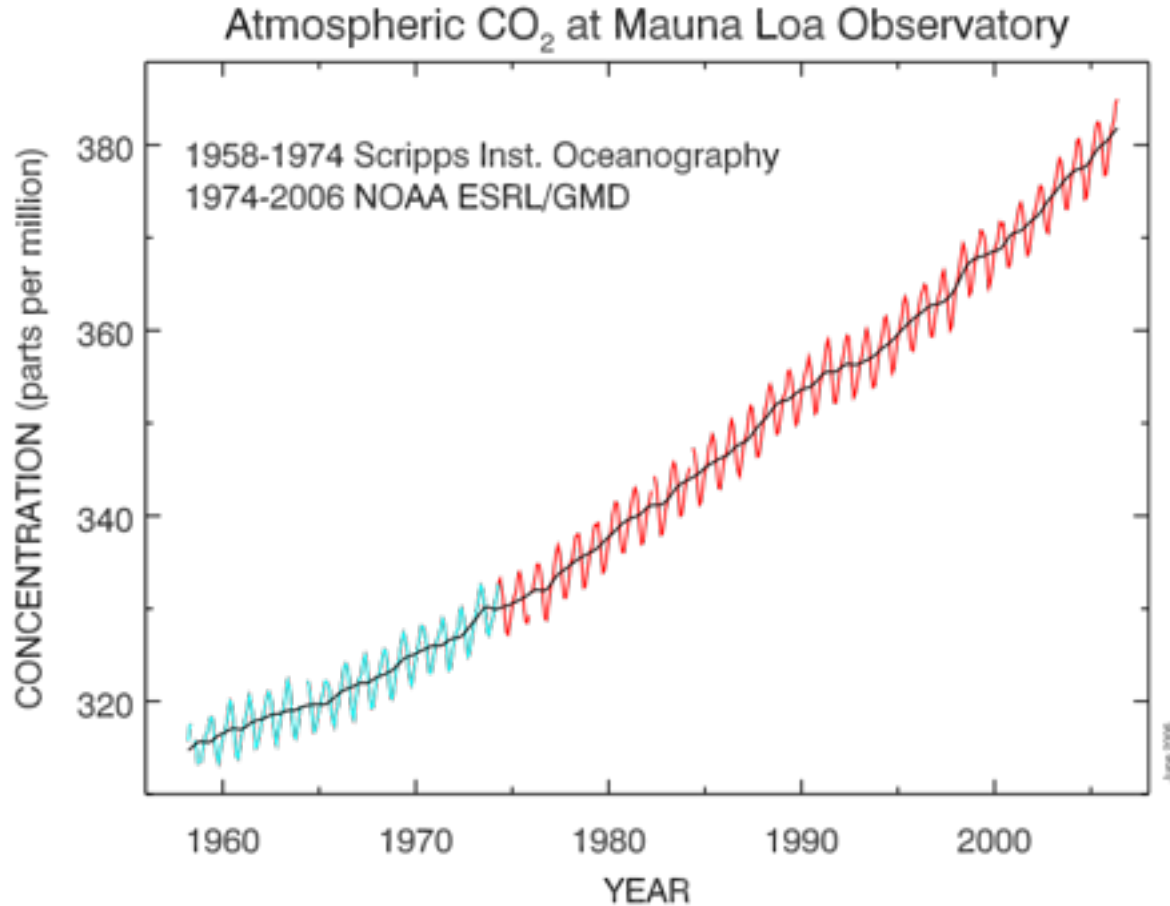
The Biodynamic Research Institute www.beras.eu

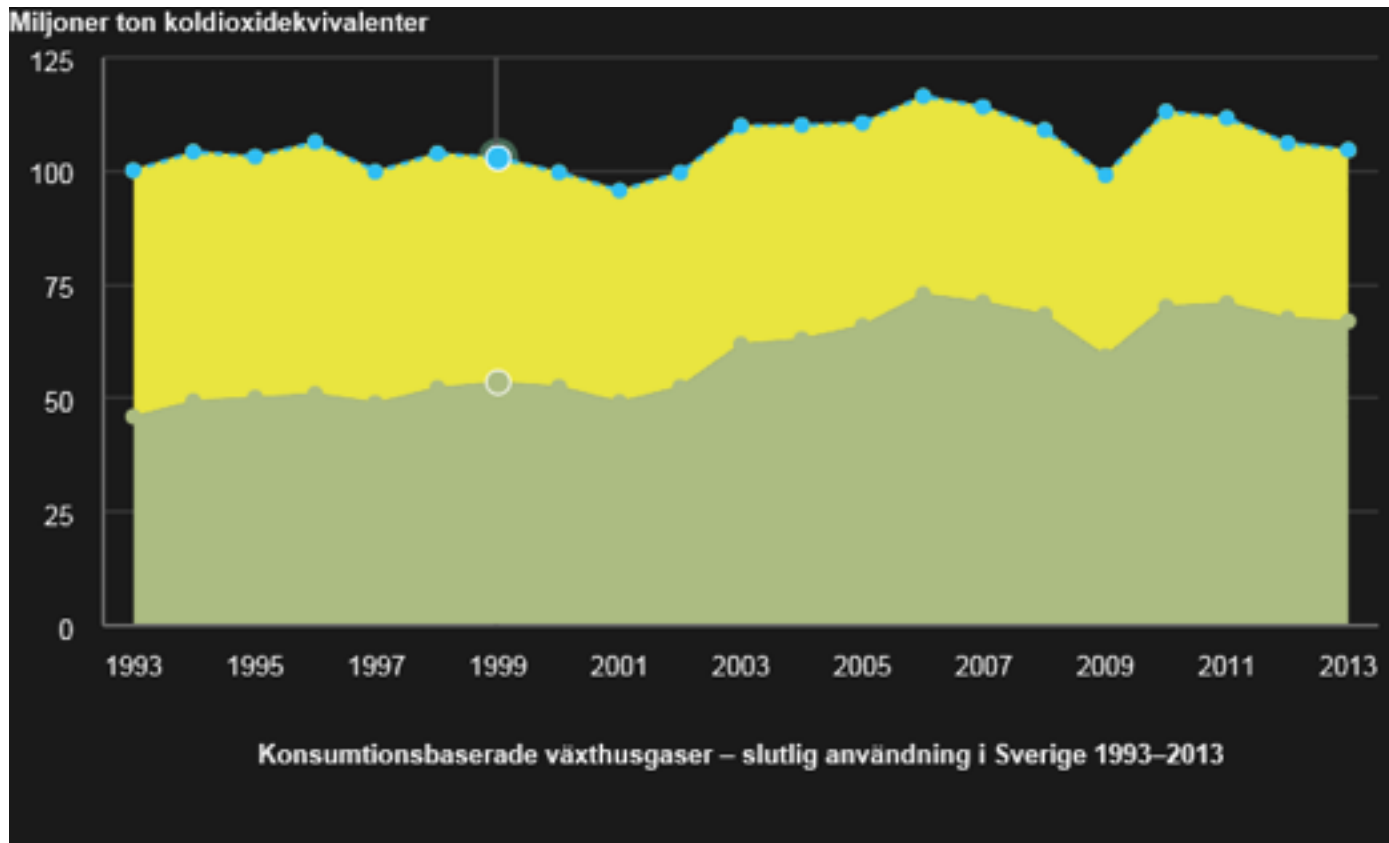
Basic ecological conditions

energy flow, recycling and biological diversity



Ch. D. Keeling mobilized enough resources so he could, starting 1958, measure the CO₂ in the atmosphere on Mauna Loa observatory in Hawaii

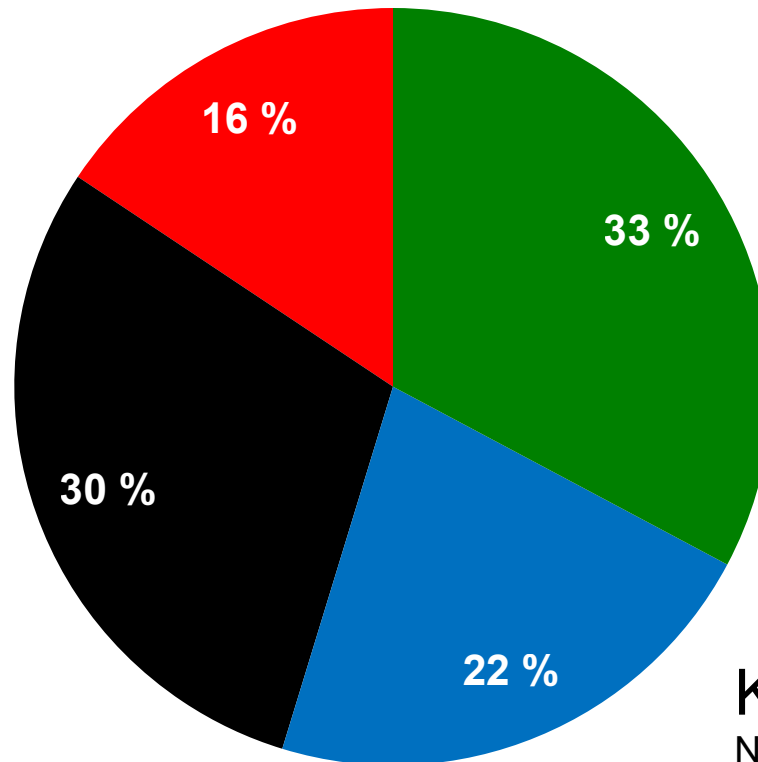




Under de senaste tjugo åren har andelen utsläpp som sker i andra länder och som orsakas av vår svenska konsumtion, ökat med femtio procent. Under samma period har de konsumtionsbaserade utsläppen i Sverige, minskat med trettio procent. *Källa: Naturvårdsverket 2016.*

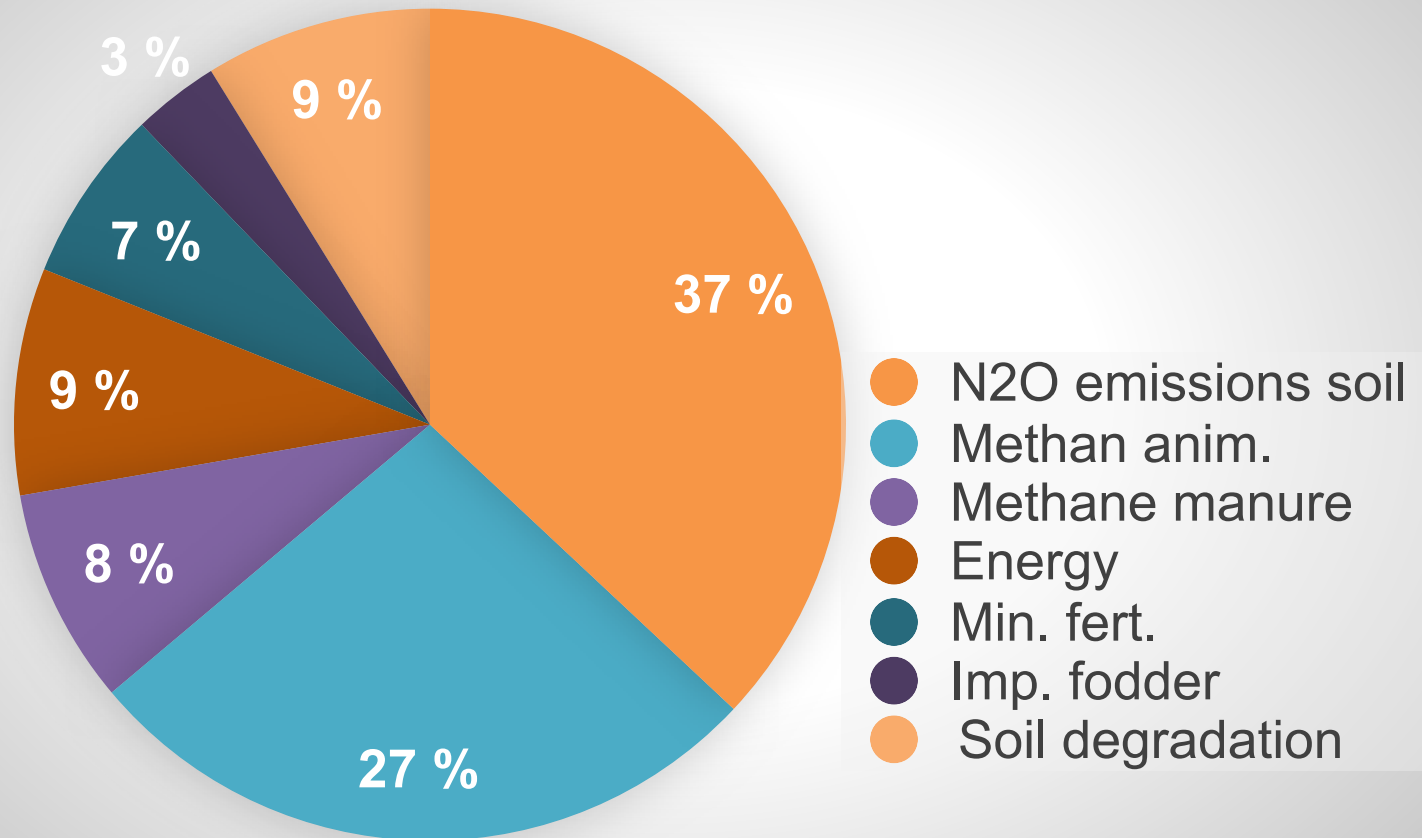
HUSHÅLLENS klimatbelastning, 2013

- Livsmedel
- Boende
- Transport
- Övrigt

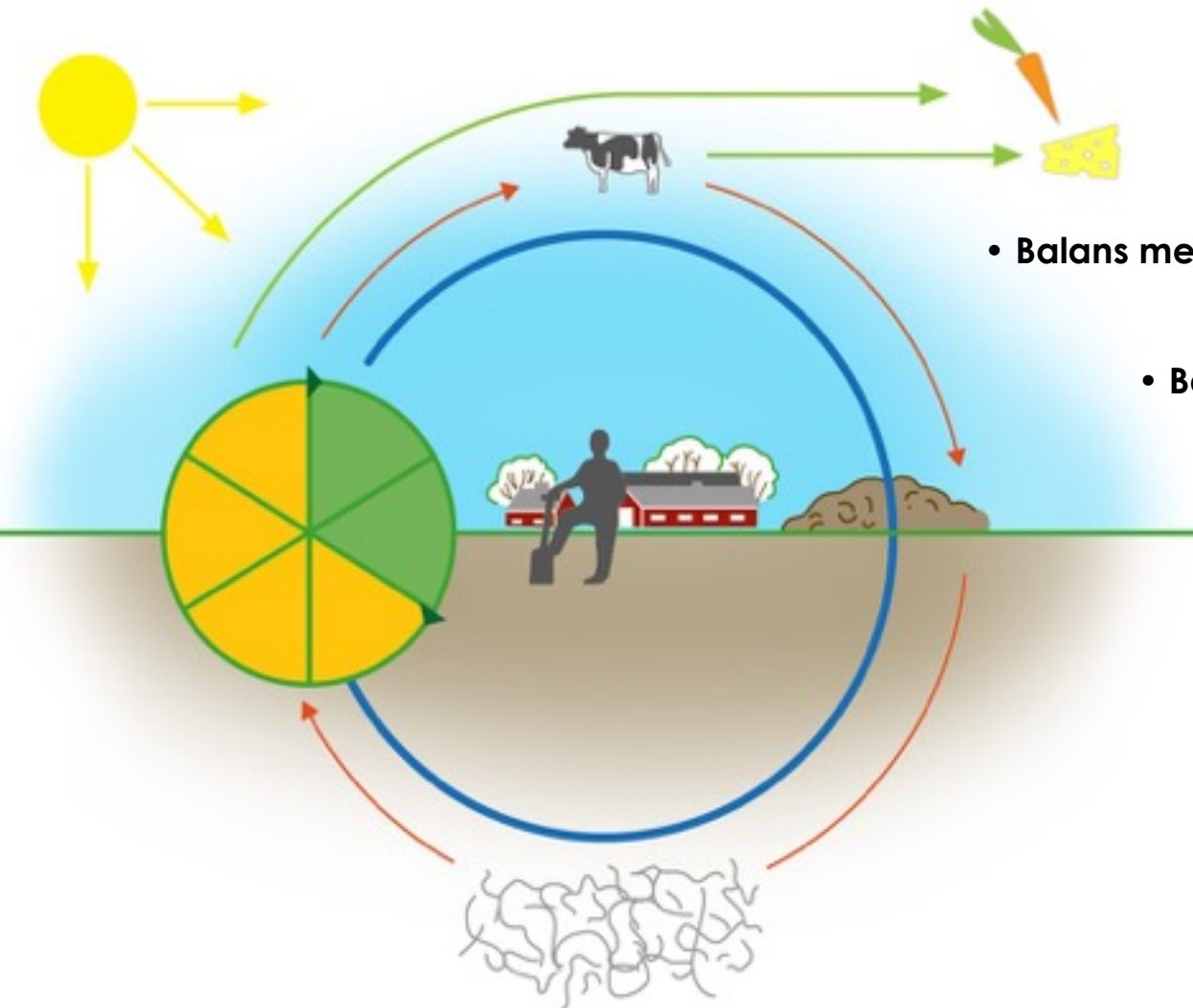


Klimatforum 2016
Naturvårdsverket

C02 eq emissions Swedish Agriculture



”Ekologiskt kretsloppsjordbruk”

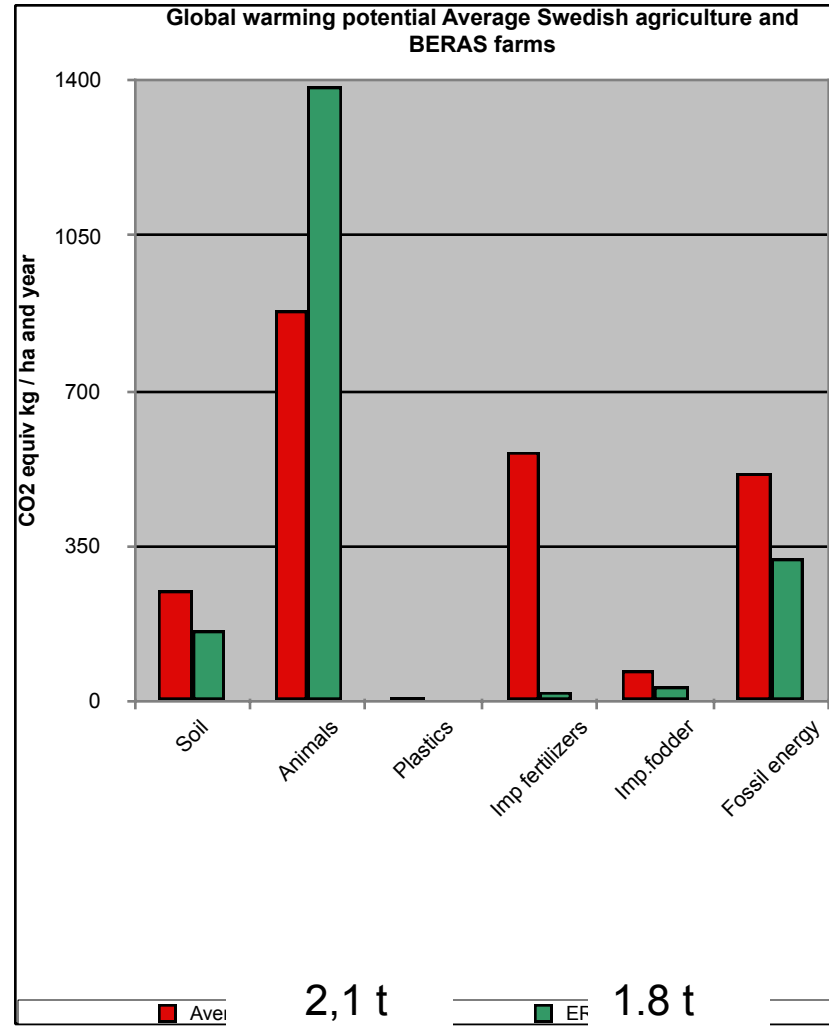
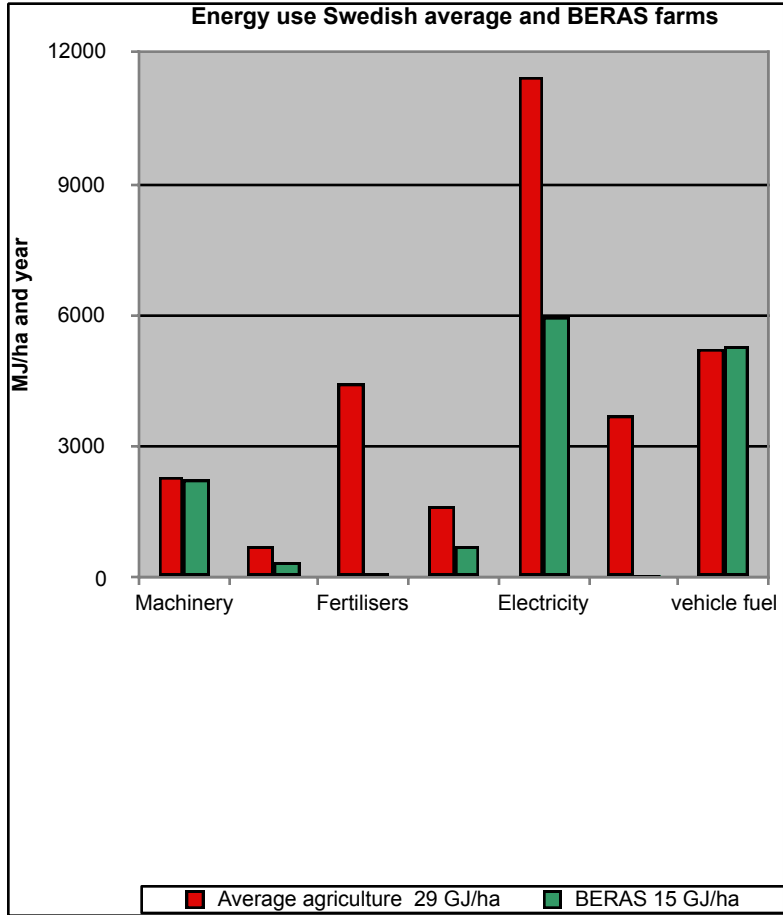


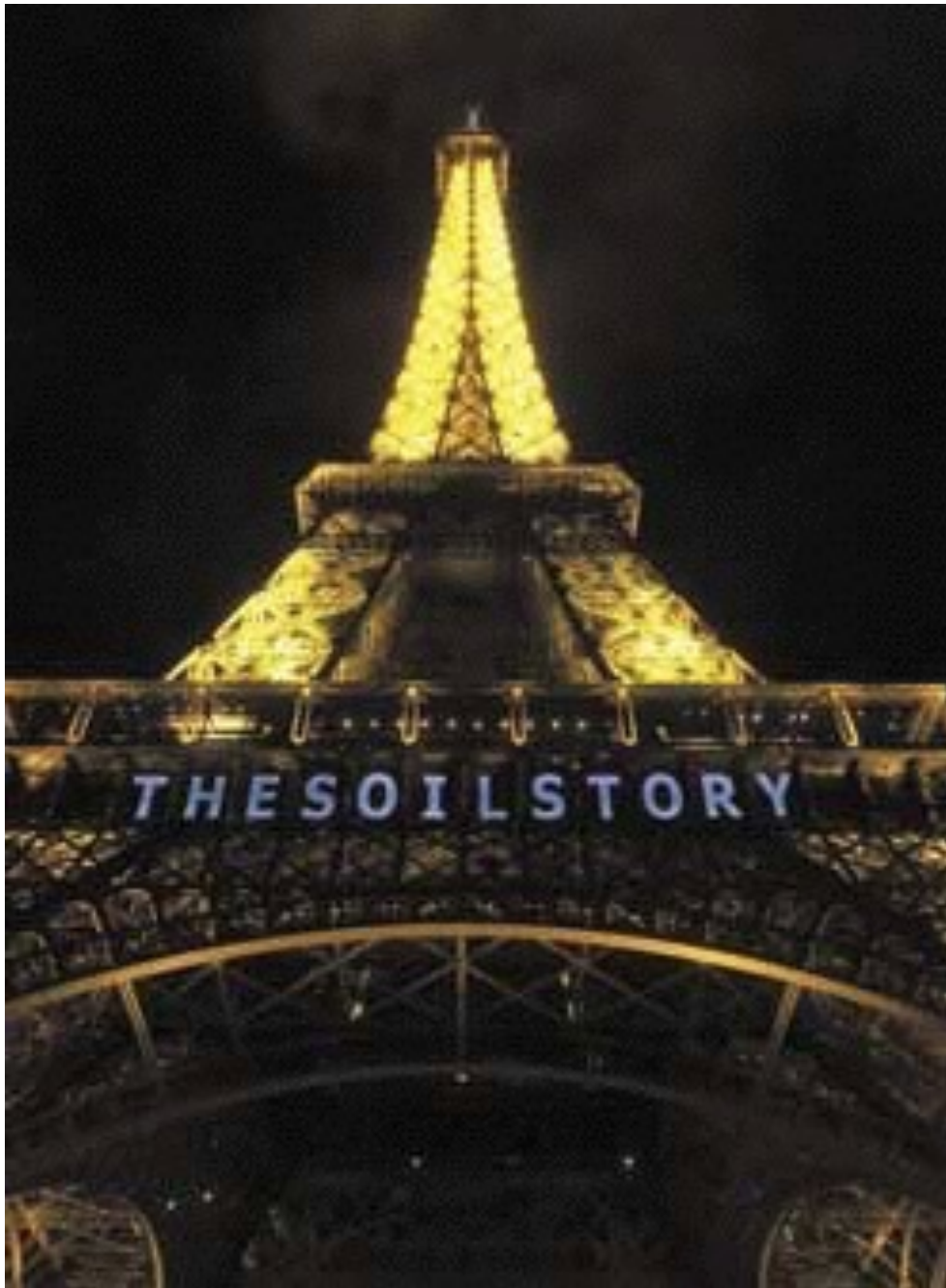
- Balans mellan närande och färande grödor i mångsidiga växtföljder

- Balans växtodling och djurhållning

- Hushållning och recirkulering av gödsel och näringsämnen

Vård av markens organiska substans och biologisk mångfald





Fyra promille kan rädda klimatet

I samband med FN:s klimatmöte i Paris: Jordbruksmetoder som leder till att kol från atmosfären lagras i matjorden som en central metod för att hejda klimatförändringarna. Den 1 december undertecknades initiativet av fler än 100 aktörer.

Granstedt, A., L-Baekström, G.(2000): Studies of the preceding crop effect of ley in ecological agriculture. American Journal of Alternative Agriculture, vol. 15, no. 2, pages 68–78. Washington University.

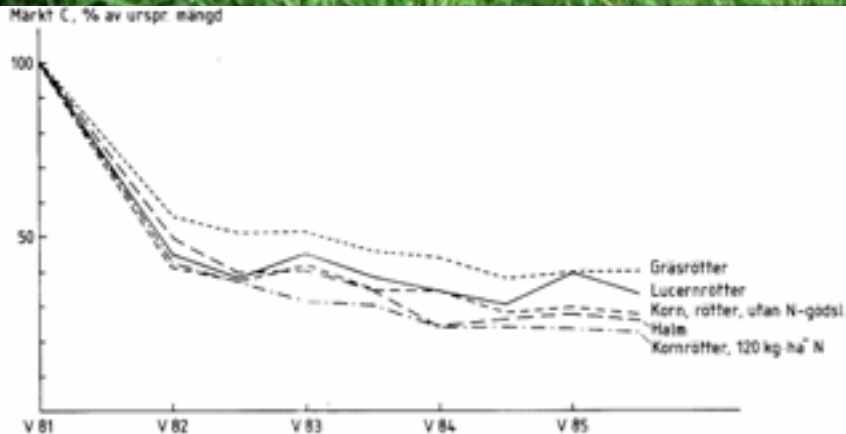
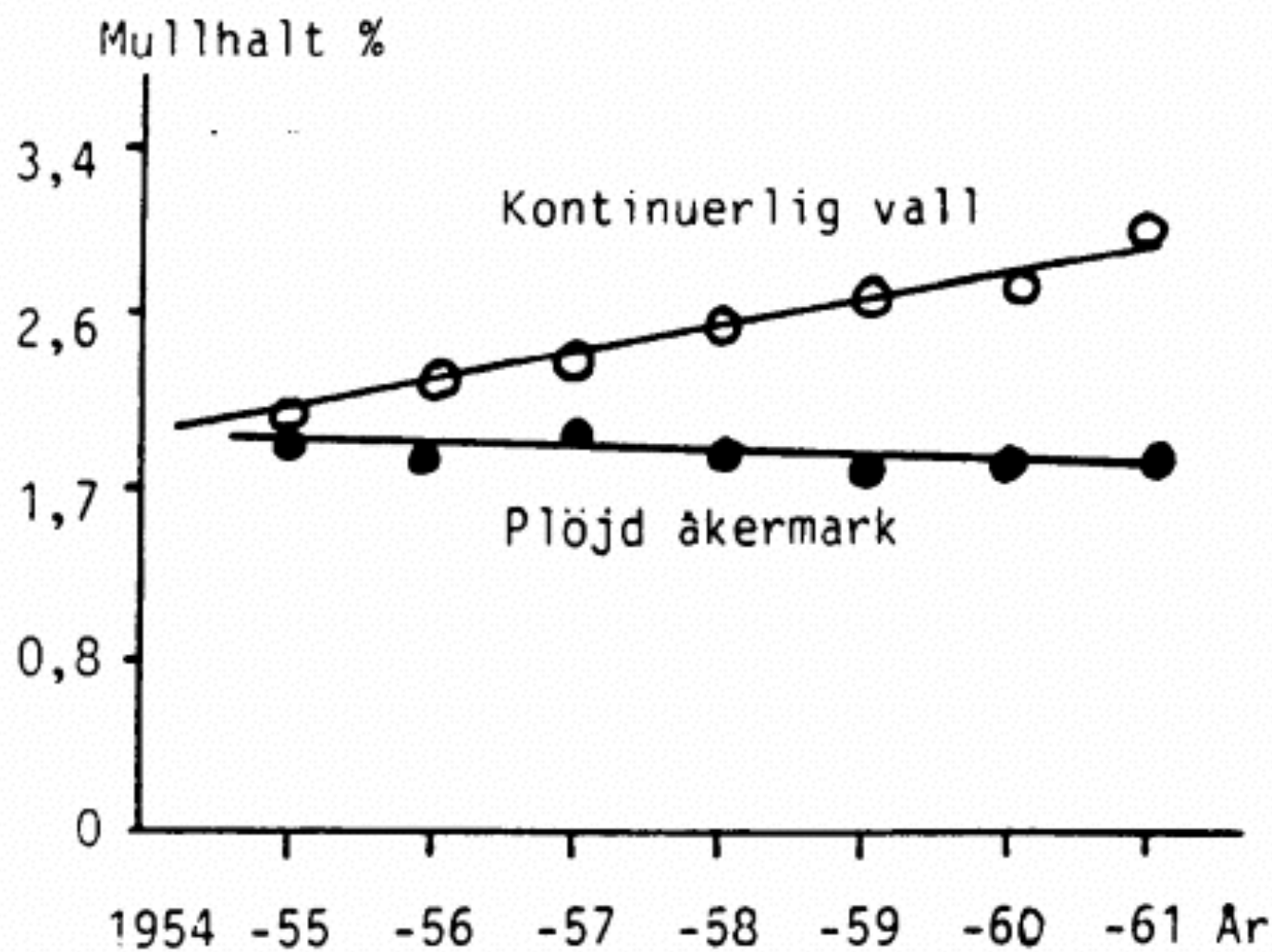
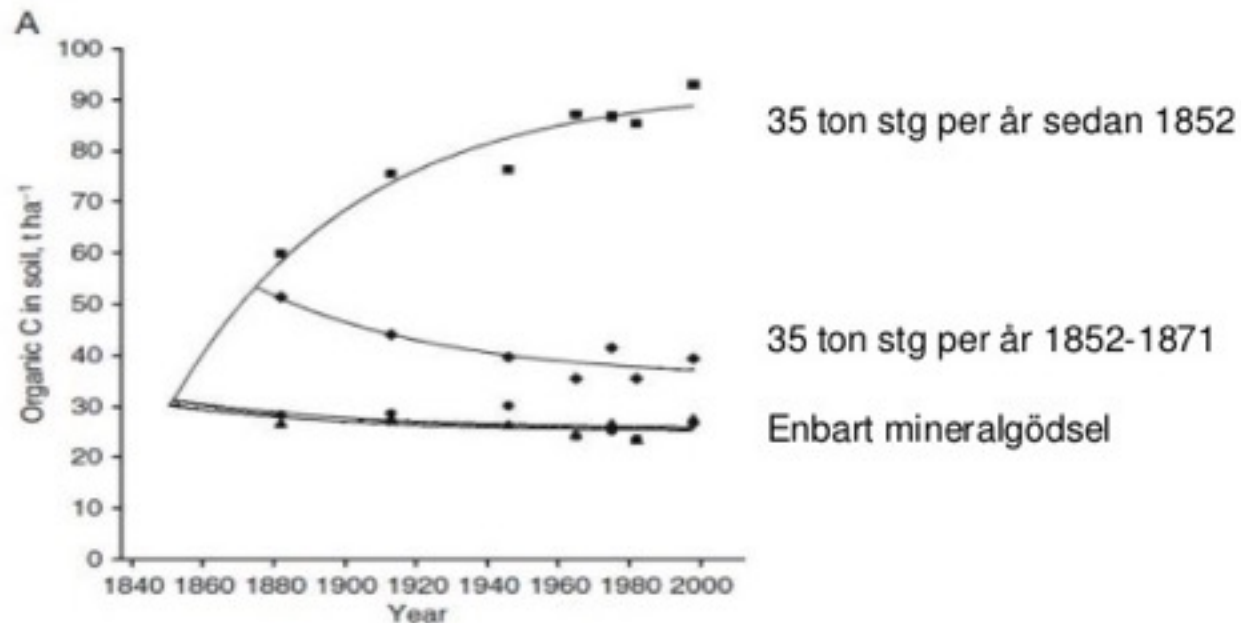


Fig. 4. Mineralisering av isotopmärkt organisk material. – Mineralization of isotope-labeled organic material.



Effekten av åtgärder för kolfastläggning avtar med tiden

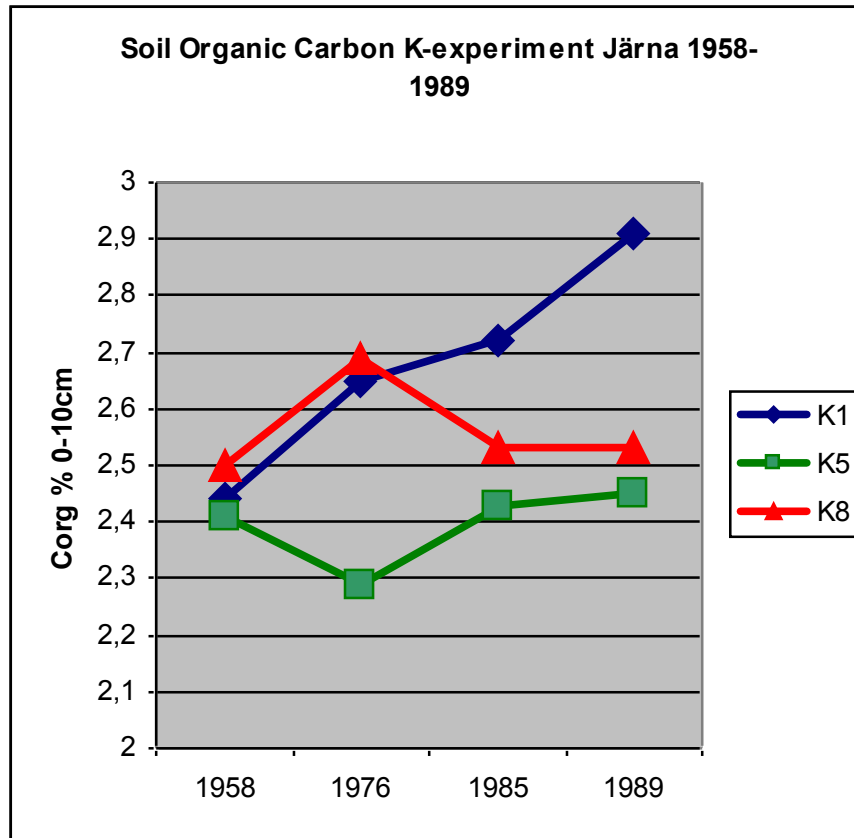
Hoosfield Continuous Barely, Rothamsted



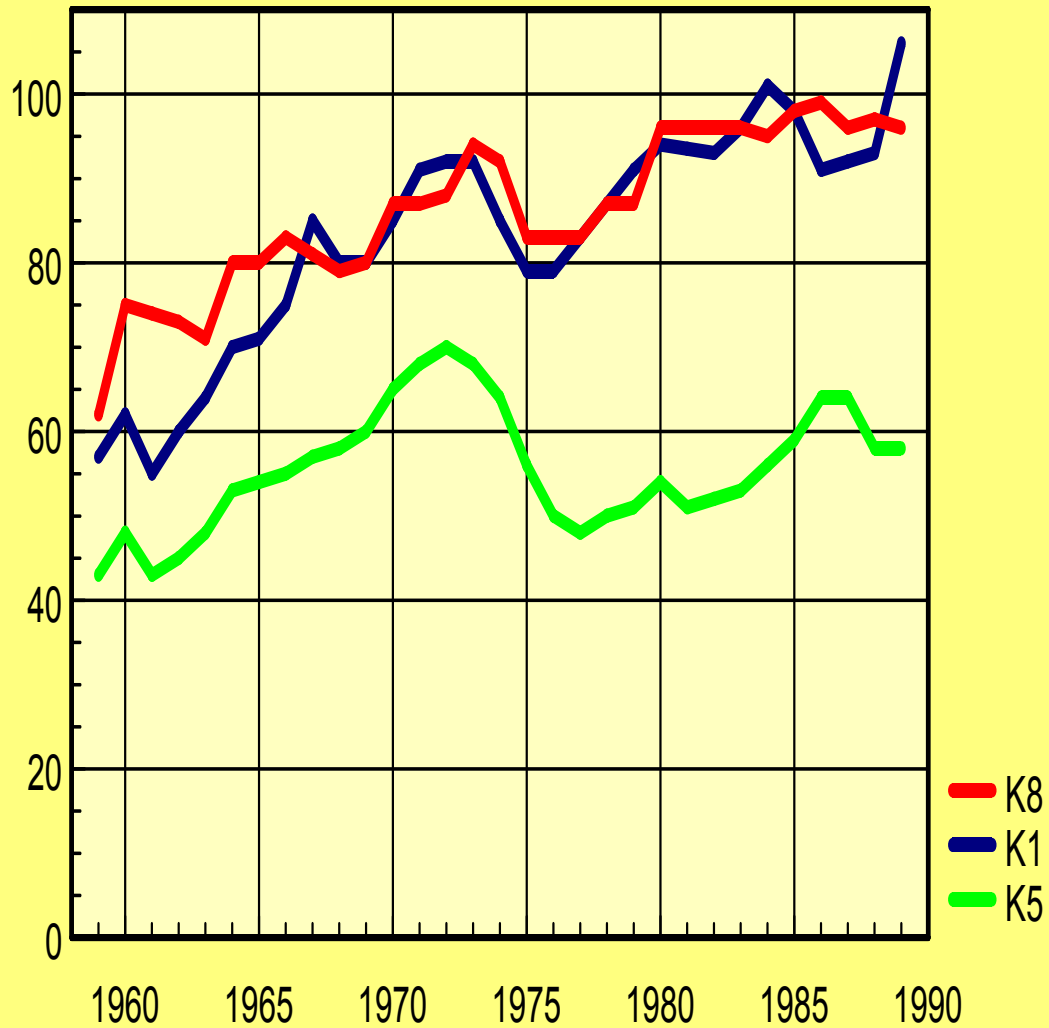
- Stallgödselns effekt på kolförrådet avtar med tiden
- Ett jämvikt ställer in sig efter ca. 200 år i vårt klimat

Johnston et al., 2009

Carbon in the topsoil increased with 20 % during 29 years in the biodynamic treatment.



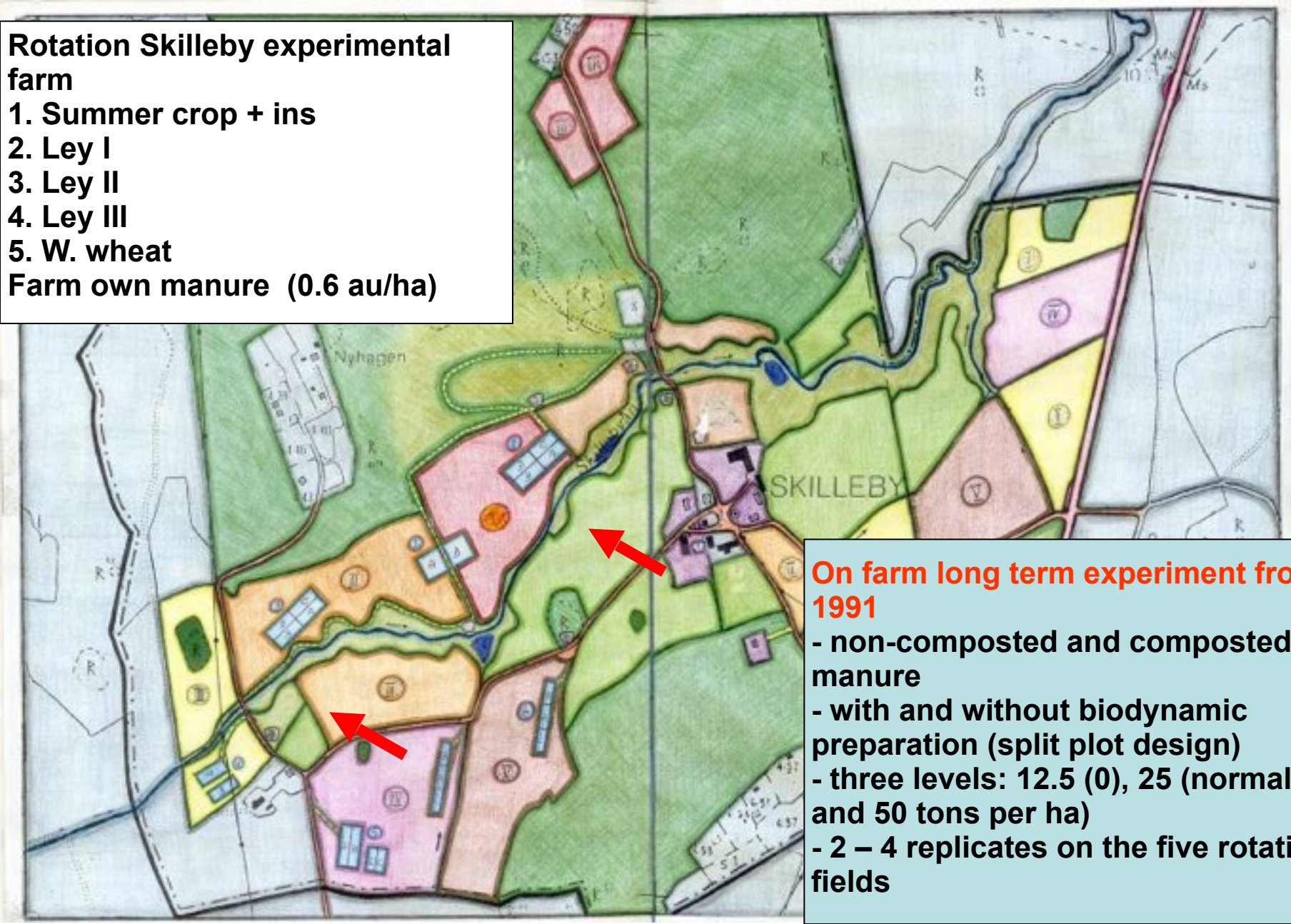
K-experiment. Yield 1000 MJ/ha



Rotation Skilleby experimental farm

1. Summer crop + ins
2. Ley I
3. Ley II
4. Ley III
5. W. wheat

Farm own manure (0.6 au/ha)



On farm long term experiment from 1991

- non-composted and composted manure
- with and without biodynamic preparation (split plot design)
- three levels: 12.5 (0), 25 (normal) and 50 tons per ha)
- 2 – 4 replicates on the five rotation fields



Long term manure experiment

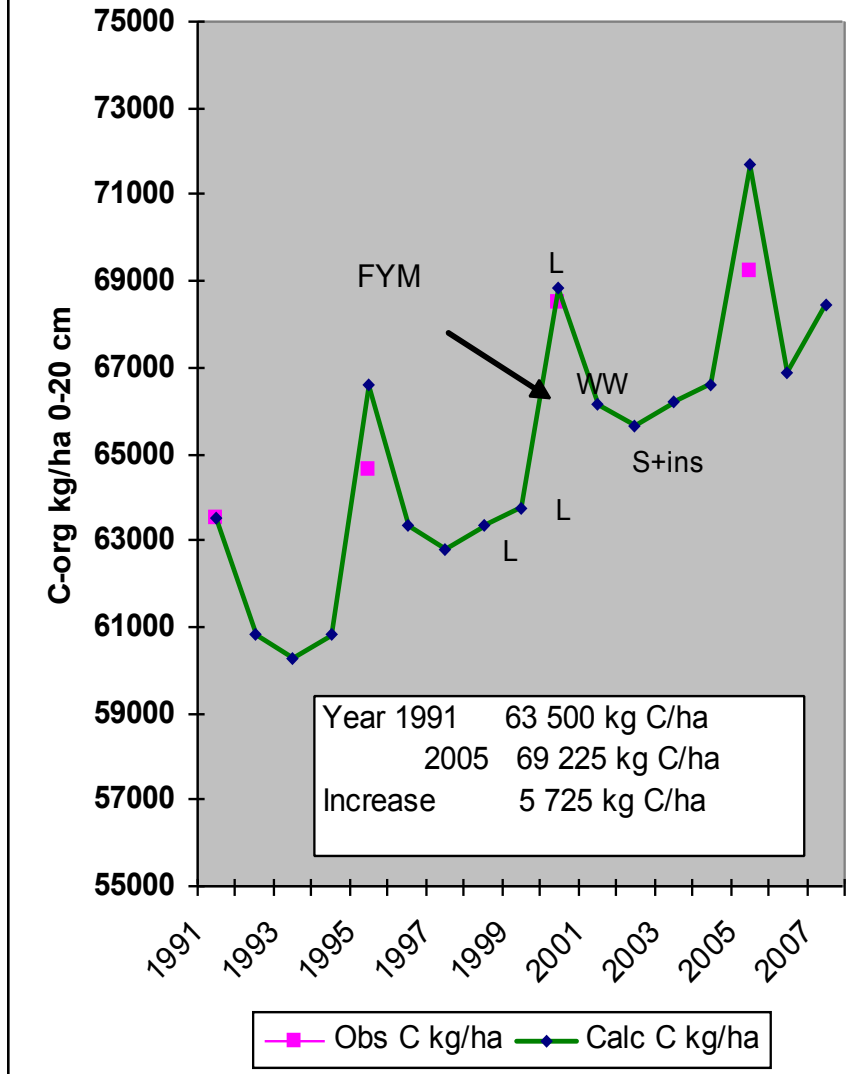


Experimental plan from 1991

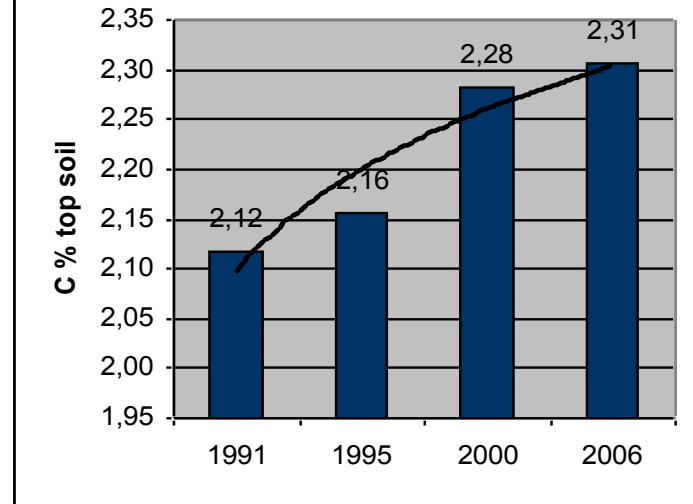


Main plot	Treatments winter wheat
F1	Not composted manure 12.5 ton (0 from 1995)
F2	25 ton
F3	50 ton
K1	Composted manure 12.5 ton (0 from 1995)
K2	25 ton
K3	50 ton
Subplot (split plot) +	BD preparation each plot each year
-	Without BD preparation

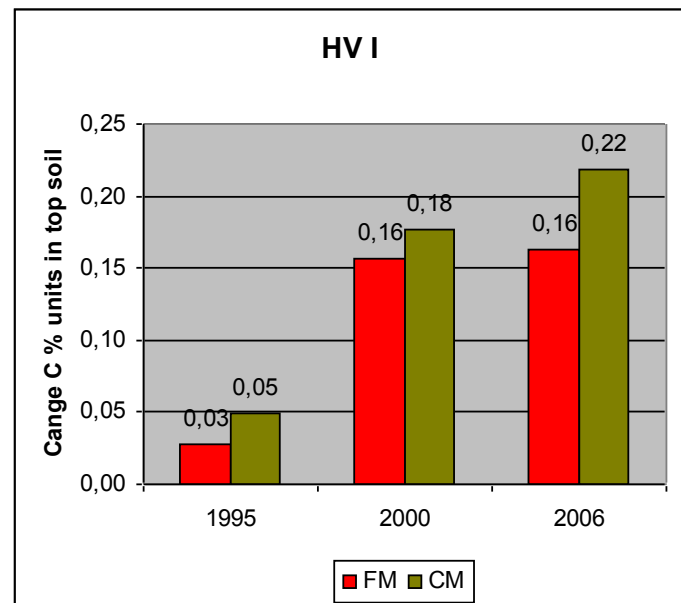
Top soil Organic Carbon HV 1



HVI



HVI



Potential for diminished GW from basic food consumption

Reduce

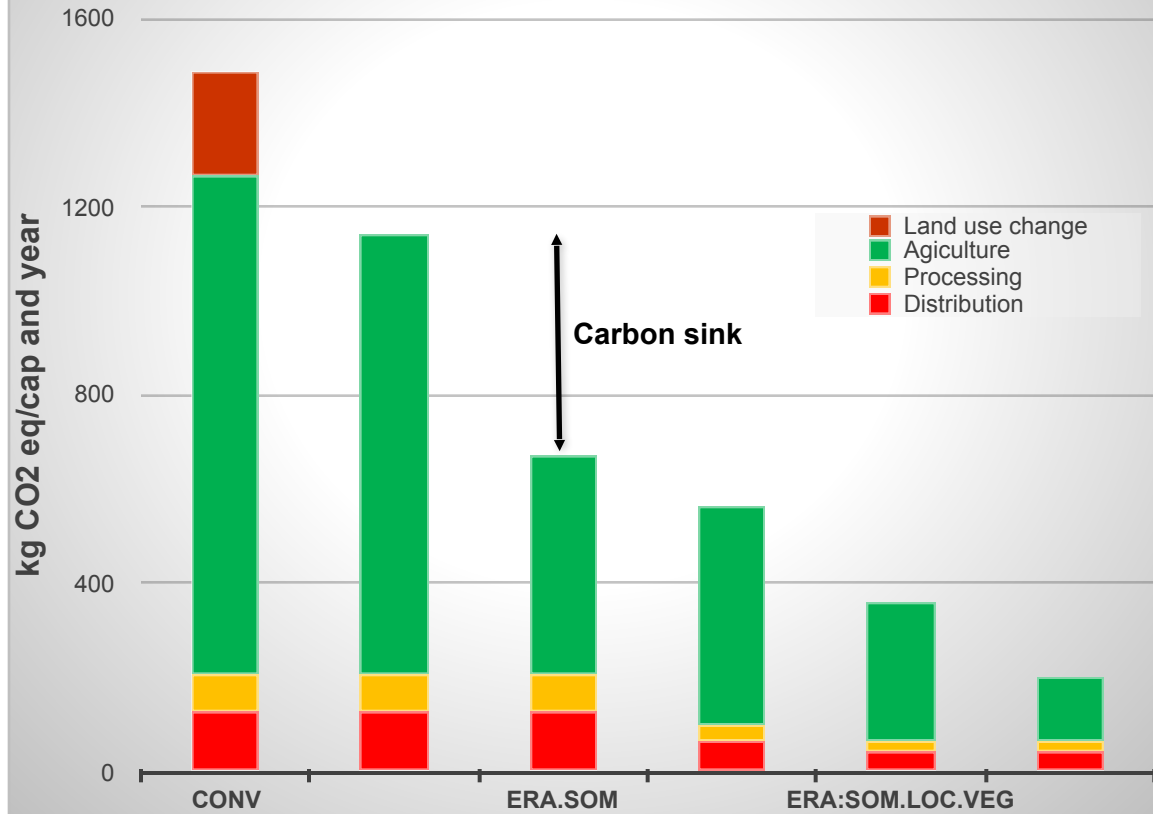
-25%

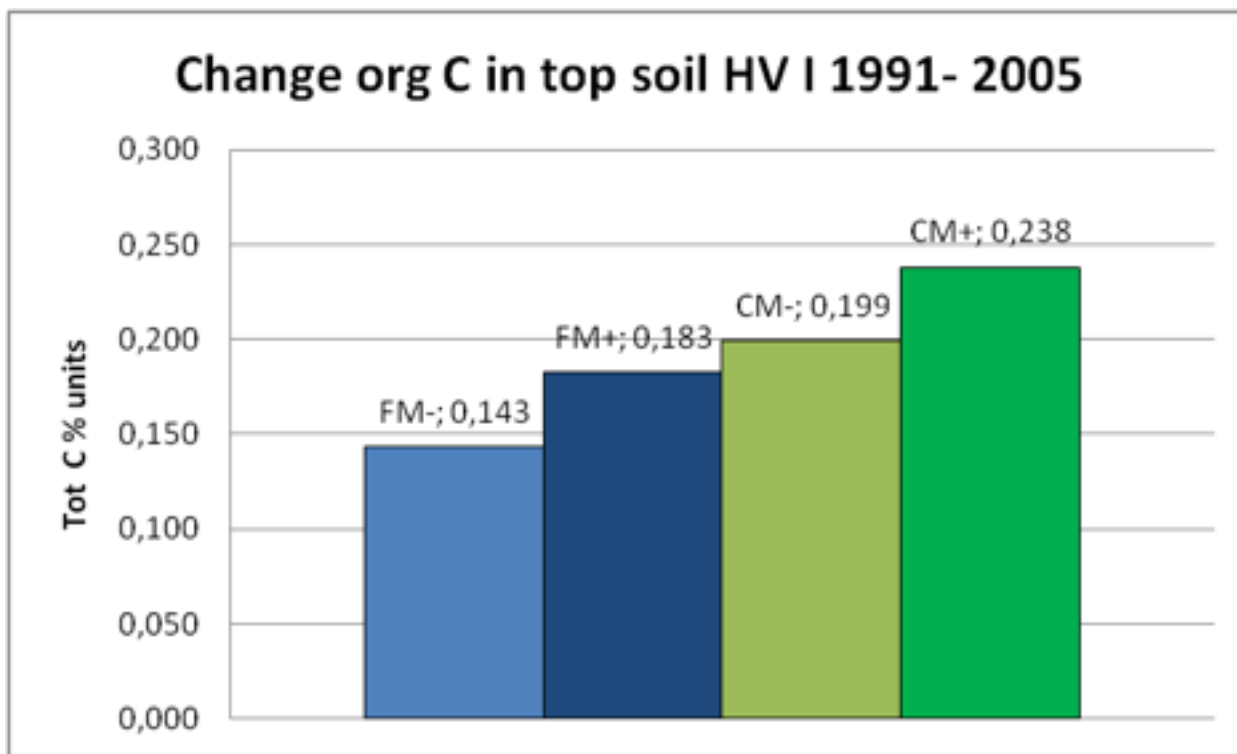
-55%

-60%

-75%

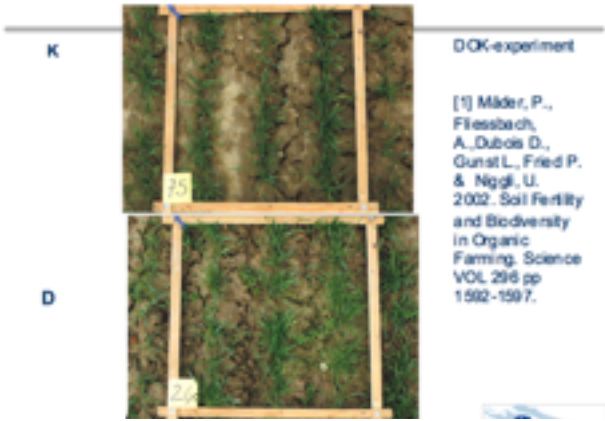
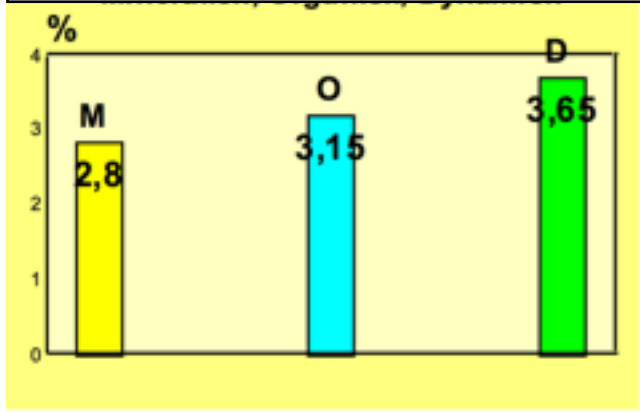
-85%





1 % unit in top soil = 30 000 kg C/ha

Humus content after 20 years in DOK trials comparing conventional, organic and biodynamic treatments



Humus content after 20 years in DOK trials comparing conventional, organic and biodynamic treatments. In the Swiss DOK -trials comparing t biodynamic, organic and conventional treatments in FiBL the humus content was, after 20 years, in conventional farming 2,8 % (M), in organic farming with organic manure 3,15 % (O) and in biodynamic farming with biodynamic manure treatments and the use of biodynamic preparations 3,65 % (D). (Mäder, et al, 2002).

Mäder, P., Fließbach, A., Dubois D., Gunst L., Fried P. & Niggli, U. 2002. Soil Fertility and Biodiversity in Organic Farming. Science VOL 296 pp 1592-1597.

Granstedt. GP 22 oktober 2015 -

