

Ekologiskt kretsloppsjordbruk Ecological Recycling Agriculture (ERA) Ecological Regenerative Agriculture (ERA)



Artur Granstedt

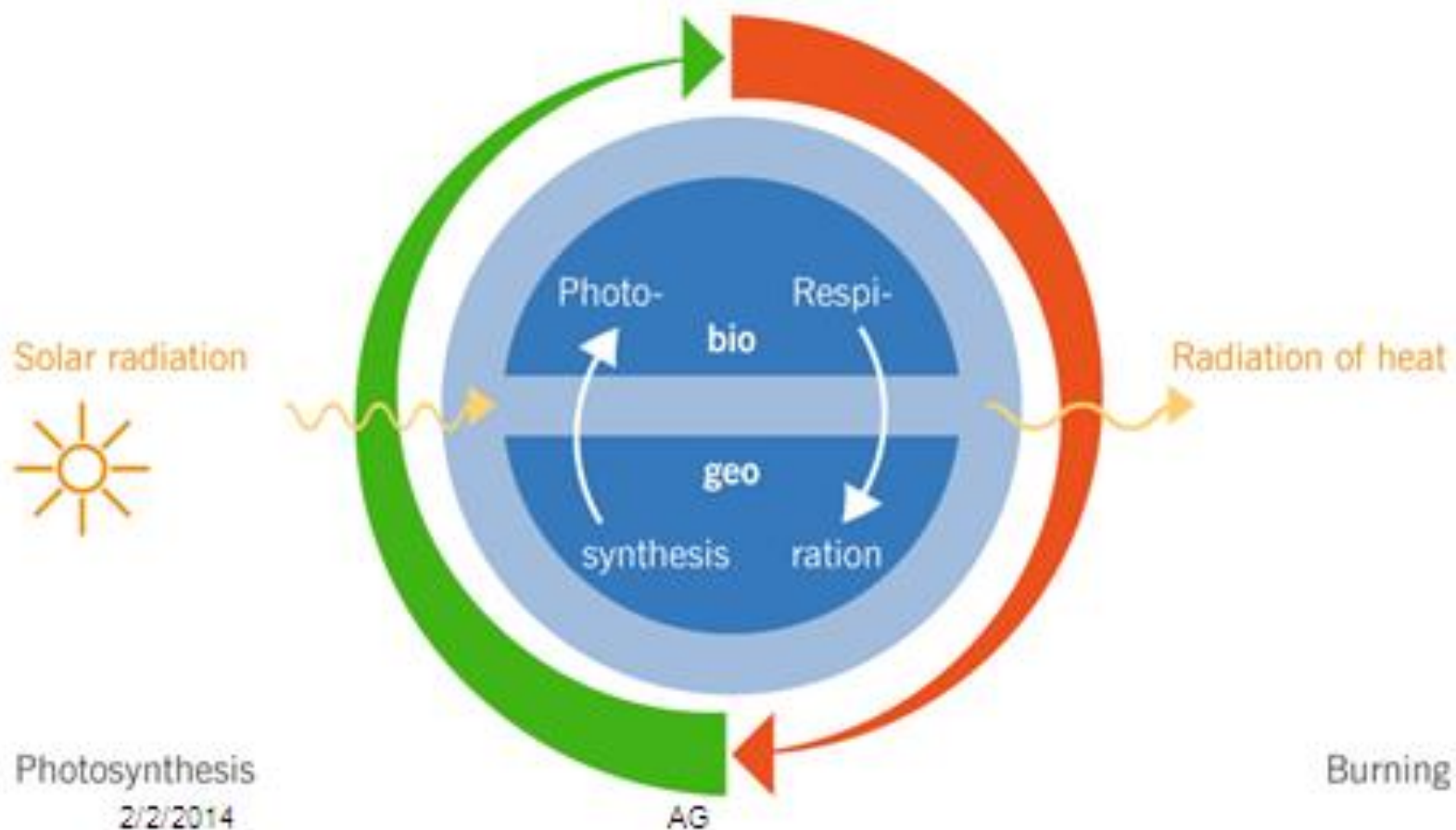
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The Biodynamic Reserach Institute www.beras.eu

Basic ecological conditions

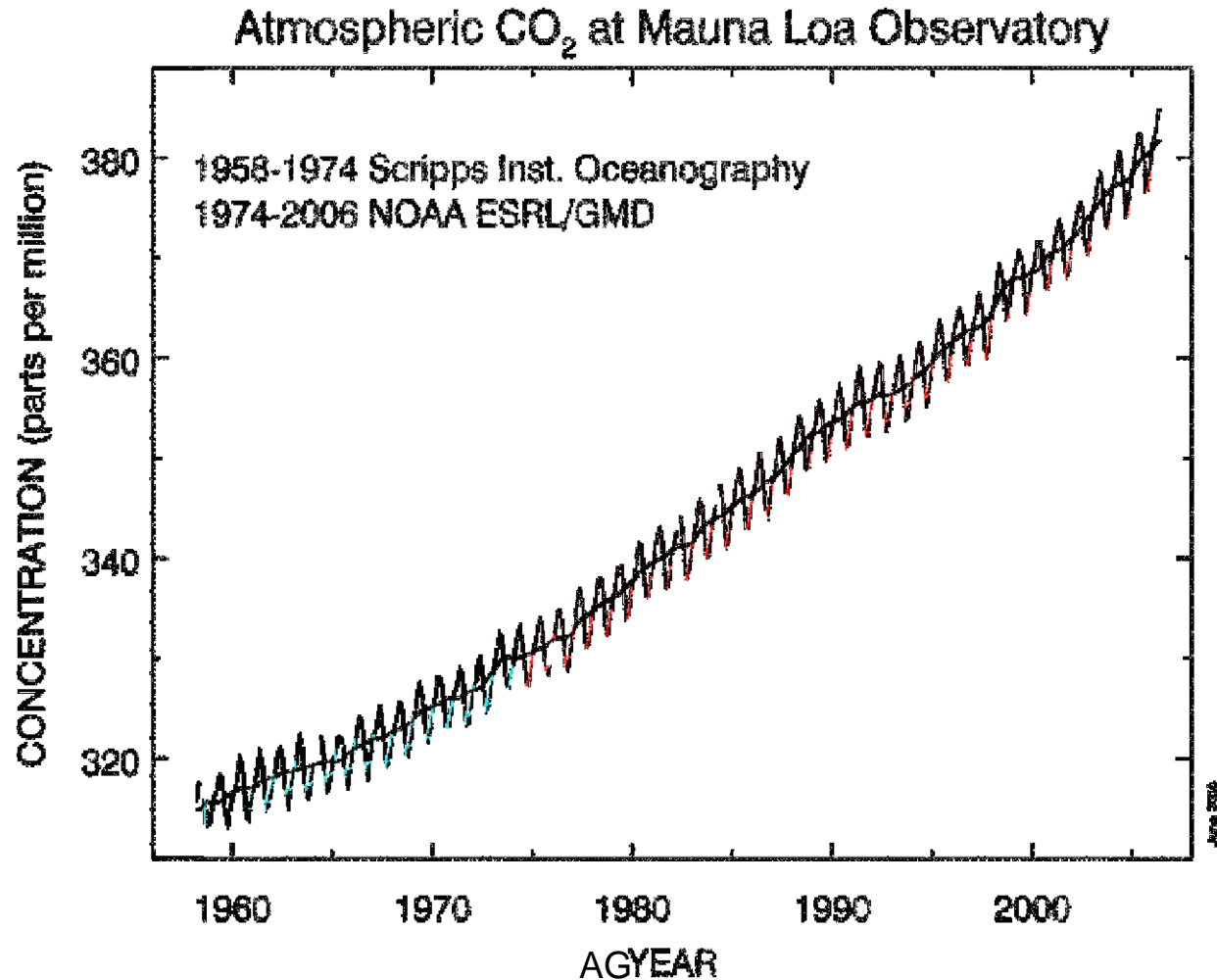
energy flow, recycling and biological diversity



Photosynthesis
2/2/2014

Ecosystem earth out of balance

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

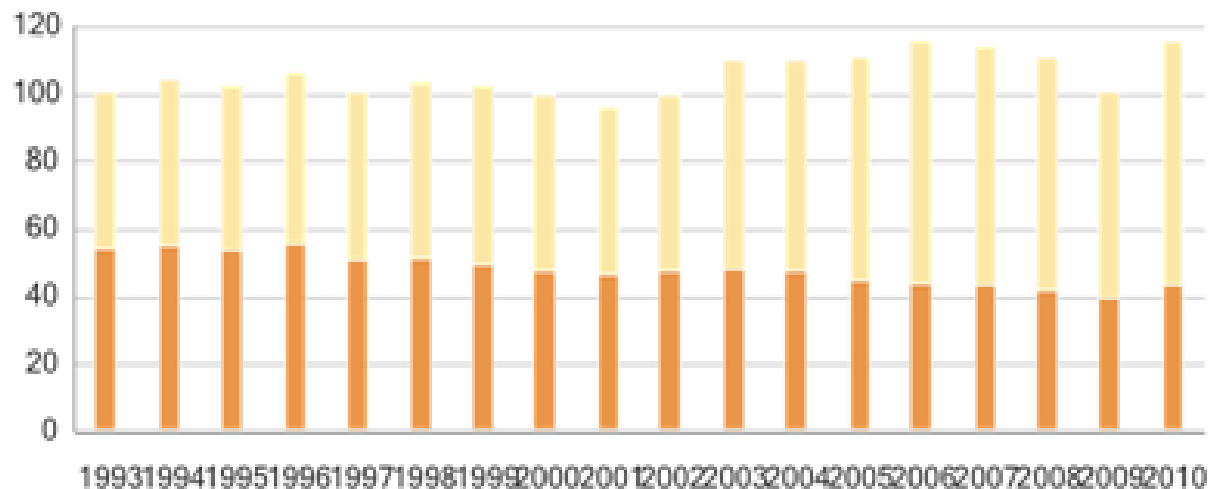


Utsläppen orsakade av svensk konsumtion har ökat med 17 procent 1993–2011

Utsläpp av växthusgaser från svensk konsumtion

□ Diagram

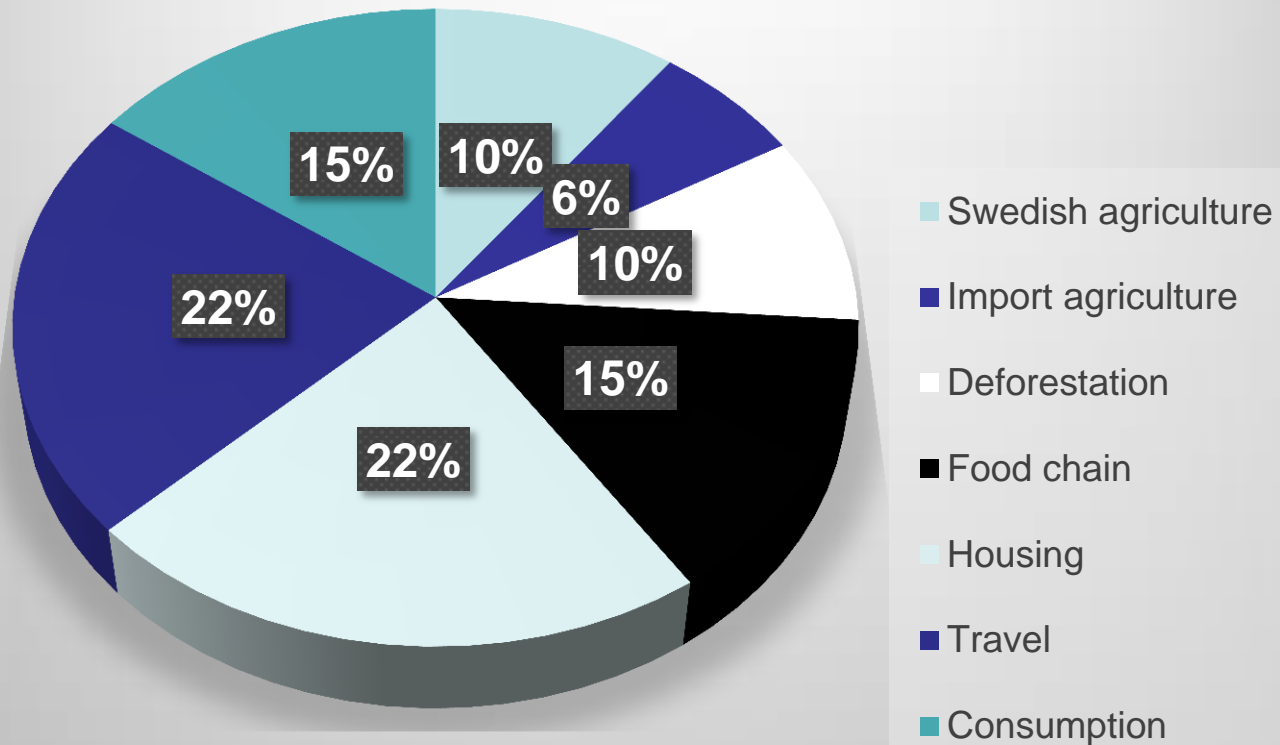
Miljoner ton koldioxidekvivalenter



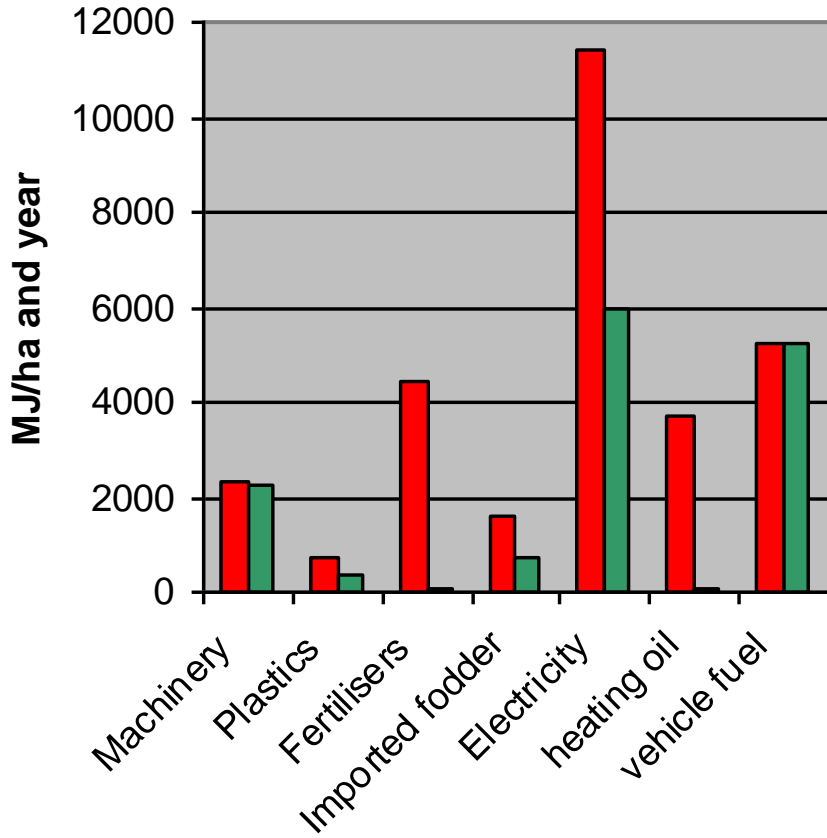
Växthusgaser - utsläpp av svensk konsumtion 1993-2010

■ Utsläpp i andra länder ■ Utsläpp i Sverige

**Sw. food consumption > 40 % of global warming on
13 t CO₂ eq /cap. and year**

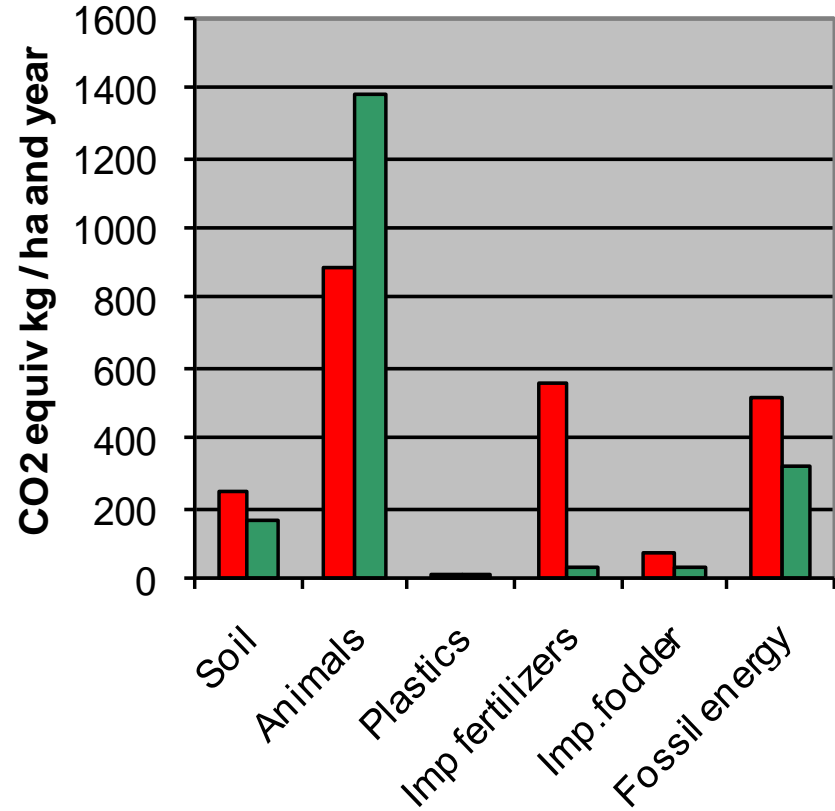


Energy use Swedish average and BERAS farms



■ Average agriculture 29 GJ/ha ■ BERAS 15 GJ/ha

Global warming potential Average Swedish agriculture and BERAS farms



■ Aver agric 2,1 t ■ ERA 1.8 t

Long term manure experiment



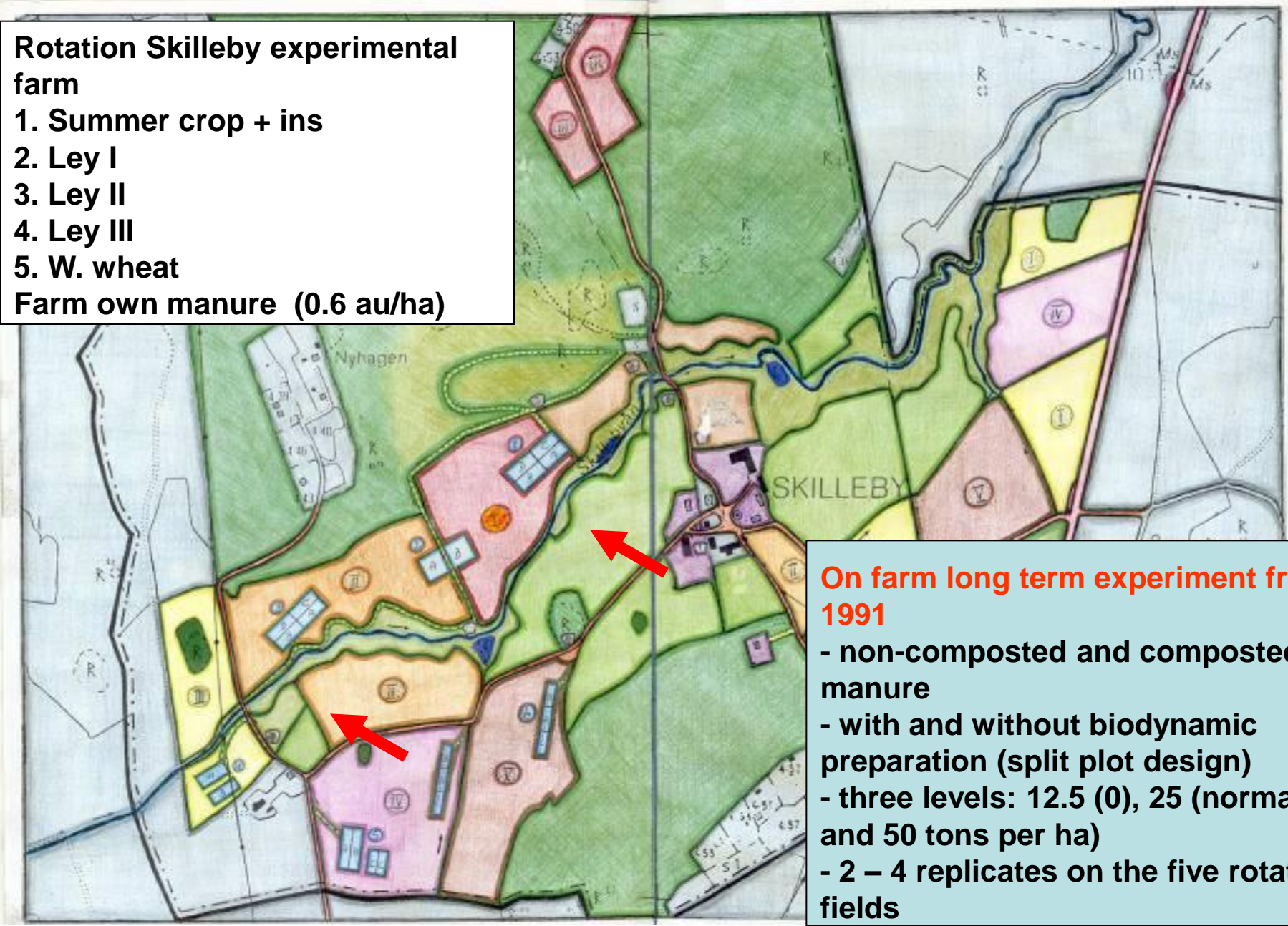
Experimental plan from 1991

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

Rotation Skilleby experimental farm

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

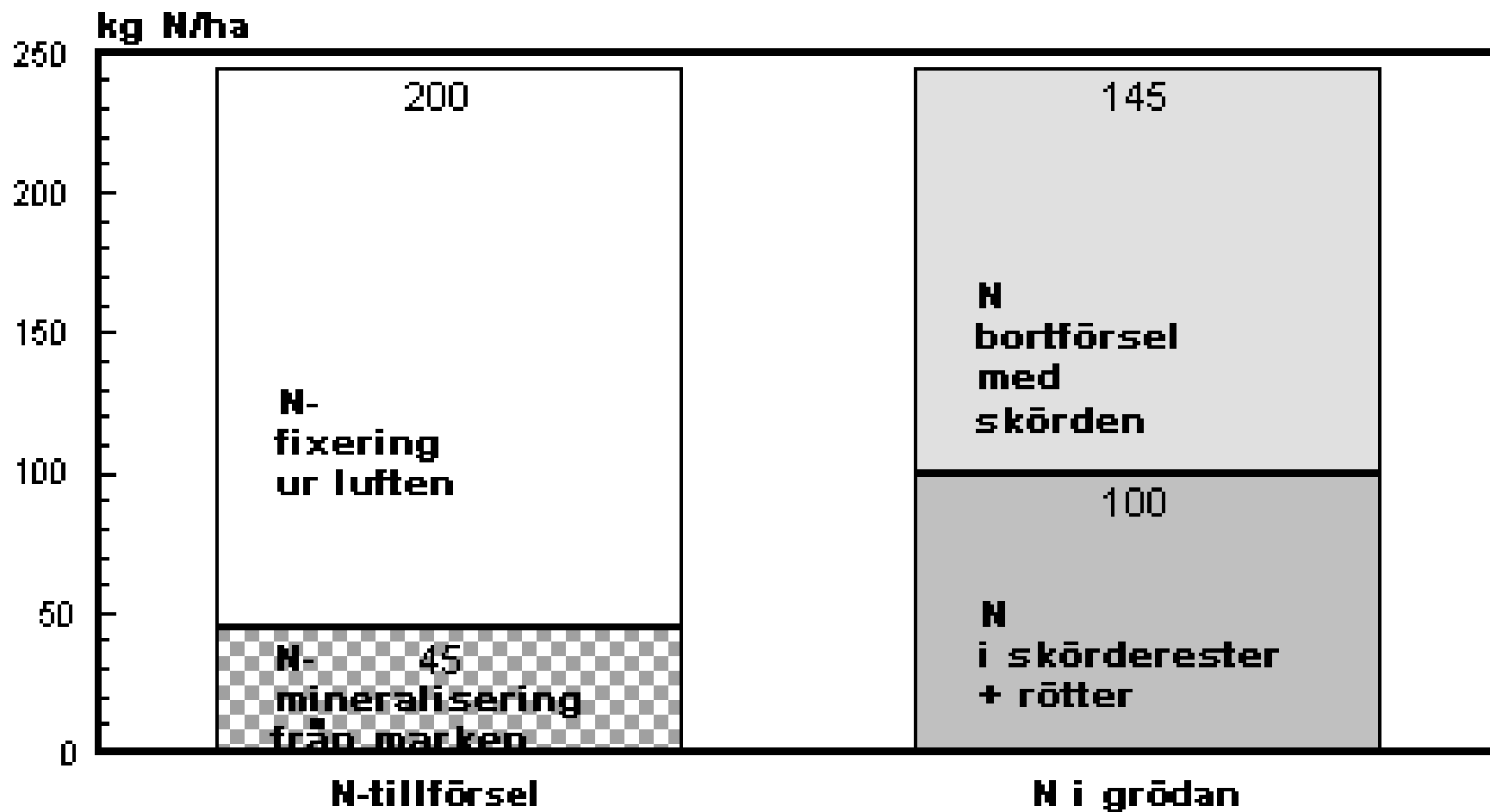
Farm own manure (0.6 au/ha)



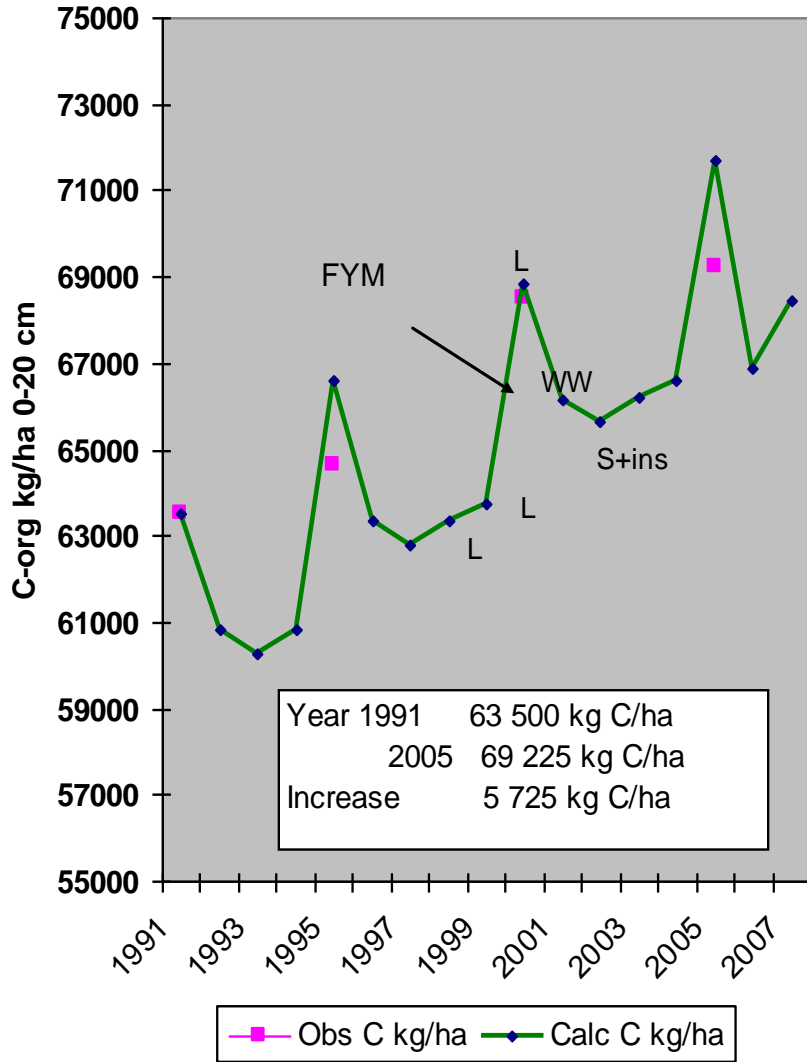
On farm long term experiment from 1991

- 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

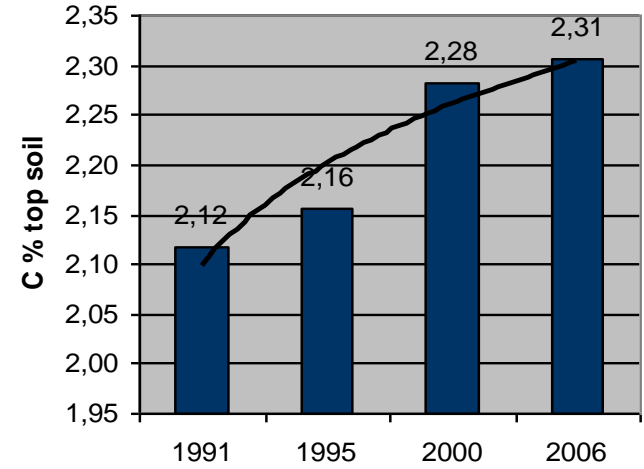




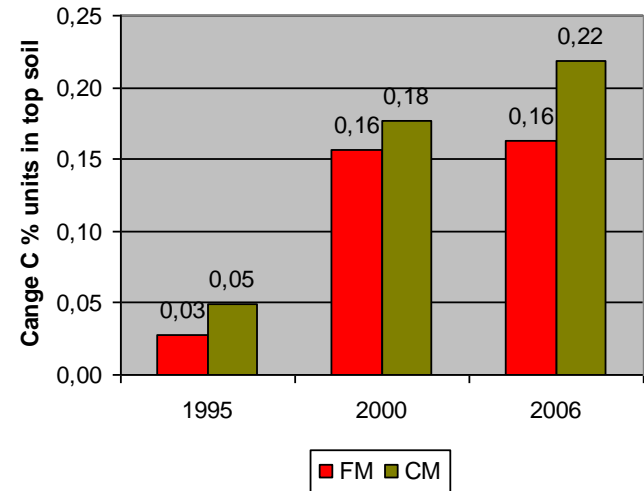
Top soil Organic Carbon HV 1



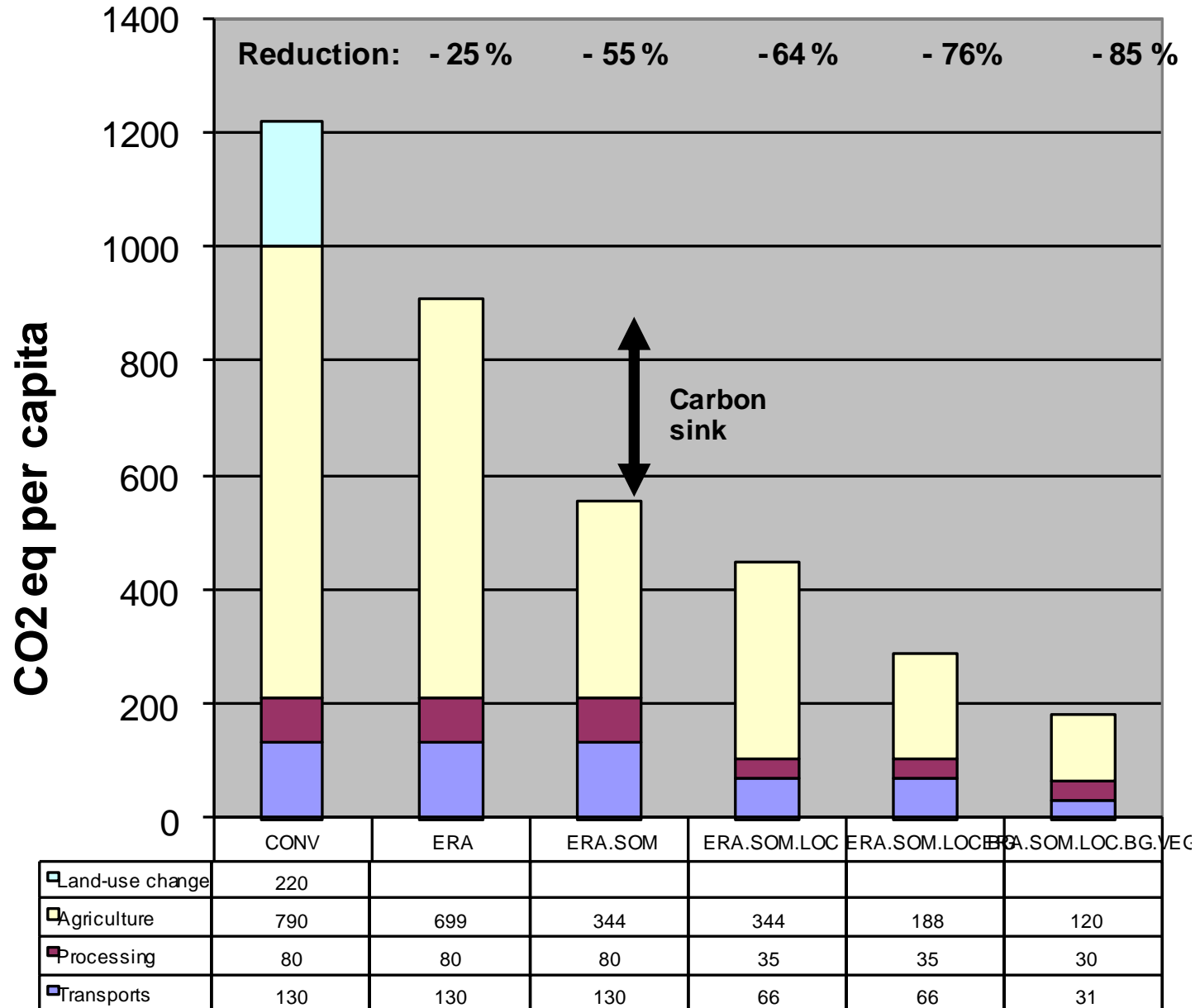
HV I



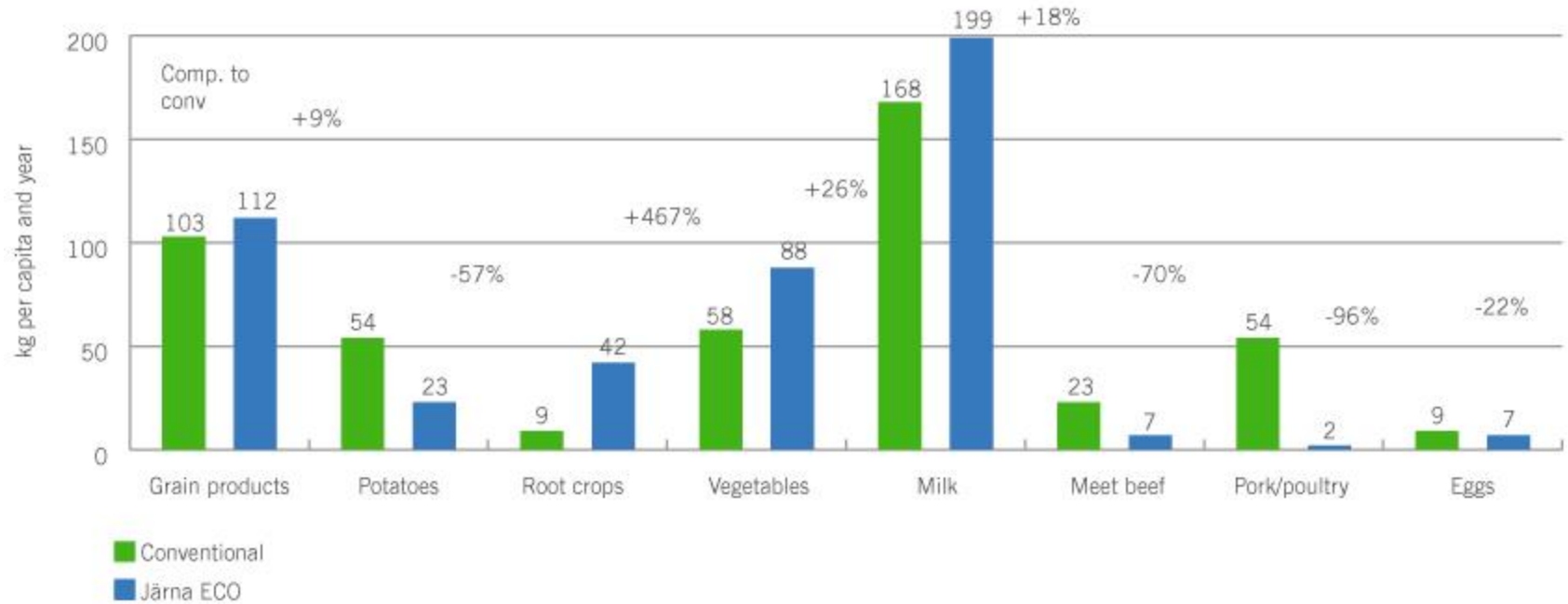
HV I



Basic food CO2 eq



Conventional and ecological consumption BERAS – Järna survey (Granstedt and Thomson 2005)



- **An ecological recycling agriculture based on integrated crop and animal production with effective recycling of nutrients and organic biomass and crop rotations with legume - grassland can:**
 - 1. conserve basic natural resources**
 - 2. rebuild fertile soils**
 - 3. protect the Sea from N, P and pesticides**
 - 4. reduce the global warming**
 - 5. Improve the food nutritional quality**

K-experiment. Yield 1000 MJ/ha

