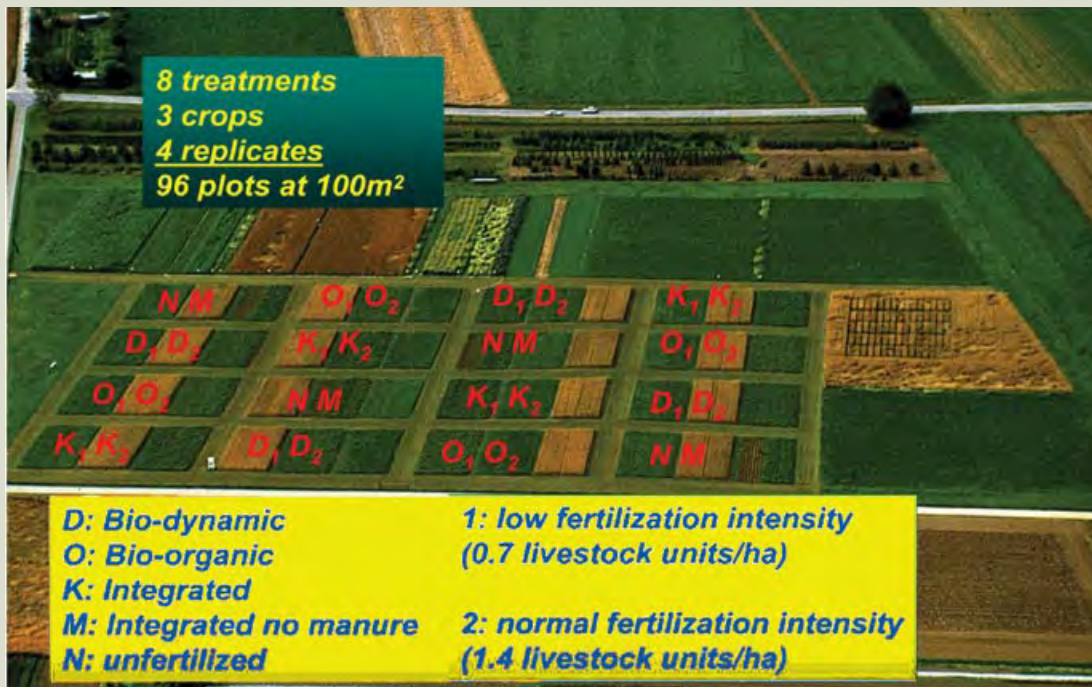
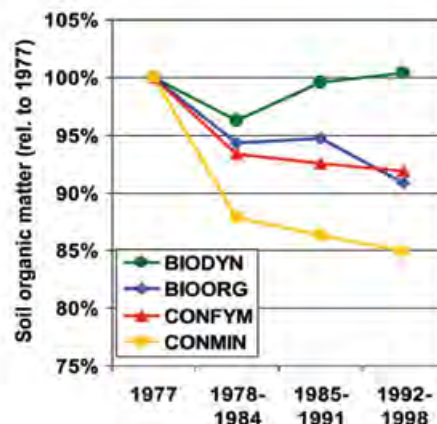


## 30 year field trial – DOK Switzerland 1977 - 2007 3, 51, 53, 54



## Bio-Agricultural farming increases soil's organic matter and carbon. Conventional farming decreases soil's organic matter and carbon.

- > Up to 15% higher soil organic carbon in soils of organic systems – this corresponds to 700 kg organic carbon sequestered annually
- > Manure use is an effective option to increase soil organic carbon also in conventional systems
- > Composted manure as in the biodynamic system has the greatest potential



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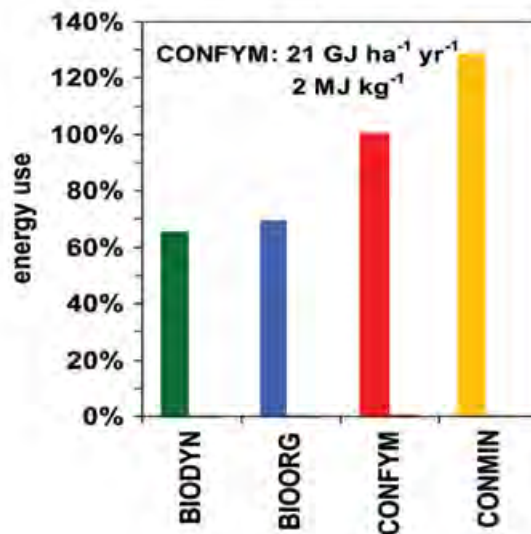
3, 51, 53, 54

- BIODYN: biodynamic with composted manure
- ◆ BIOORG: bioorganic with rotted manure
- ▲ CONFYM: conventional with manure and mineral fertilizer
- CONMIN: conventional with mineral fertiliser only

\*700kg of organic carbon sequestration = 2.57 tonnes CO<sub>2</sub>-e/hectare/year

## Chemical fertiliser production and use increases CO<sub>2</sub>-e emissions. Results from life-cycle assessments: Energy use

- > Energy use in organic systems is 33 % lower than in conventional and 48 % lower than in conv. mineral system
- > The difference is mainly due to the indirect energy needed for N-fertilizer production



FiBL

3, 51, 53, 54

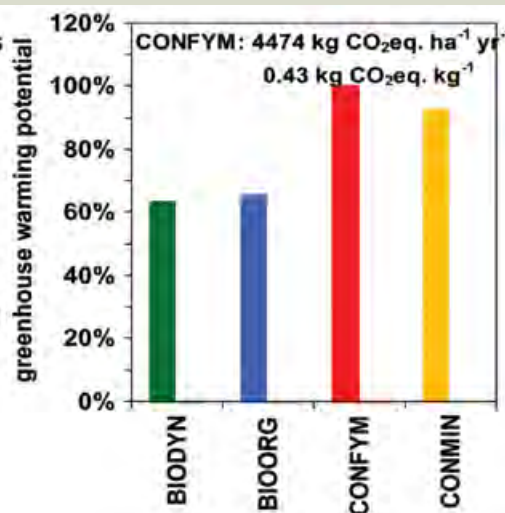
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## 38% of all agricultural emissions are synthetic fertiliser related.

*The Stern Review 2006*

### Results from life-cycle assessments: Greenhouse warming potential (GWP)

- > GWP in organic systems is 36 % lower than in conventional and 31 % lower than in conv. mineral system
- > The difference is due to the energy needed for N-fertilizer production
- > Due to the higher potential for eutrophication and acidification by manure the mineral system has a slightly lower GWP



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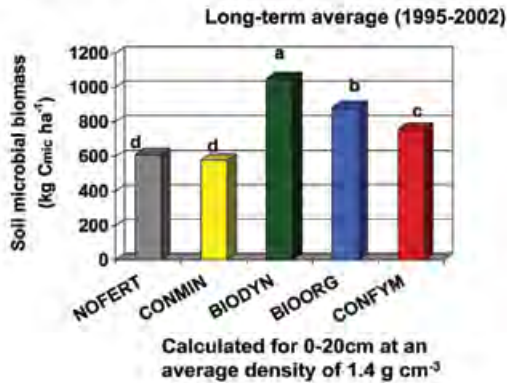
3, 51, 53, 54

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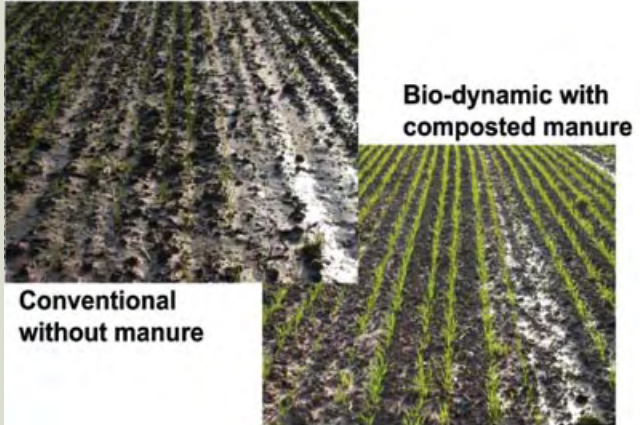
## The DOK farm trial in Switzerland over 23 years. 3, 51, 53, 54

**Bio-Agricultural farming methods increase soil fertility and biodiversity, reversing soil erosion and degradation.**

### DOK: Soil microbial biomass

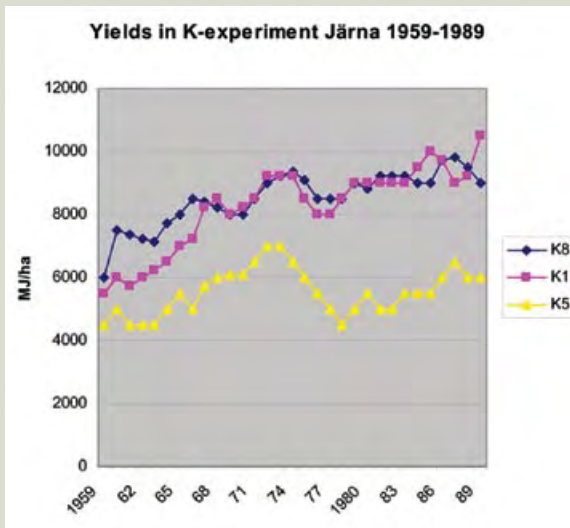


### Soil structural stability

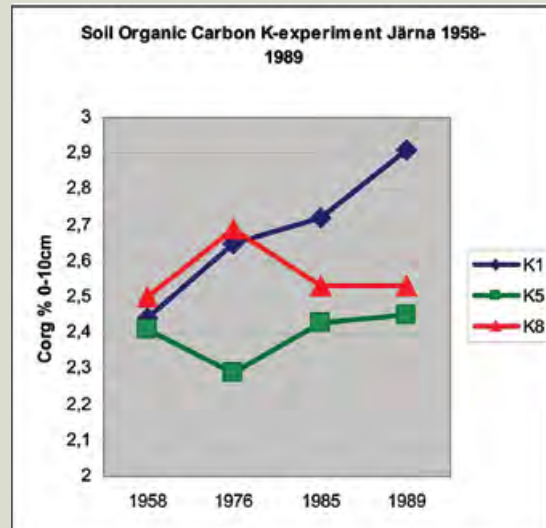


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- CONMIN: conventional with mineral fertiliser only

**Biodynamic yields are equal to conventional, but soil carbon is 16% higher.**



Yields in K-experiment over thirty years showed a continued increase in yields. After a ten year period, the yields in the biodynamic (K1) and conventional (K8) fertilised systems were the same.



Organic carbon in the topsoil 0-10 cm in Järna K-experiment 1958 - 1989 in K1 (Biodynamic fertilising), K5 (without fertilising) and K8 (mineral fertilising).

**32 YEAR STUDY – NORDIC RESEARCH CIRCLE, JAERNA. BO PETTERSON 1958-1990. 5, 6, 31**