



Fylkesmannen i Buskerud

County Governor in Buskerud

The Living Soil Project

Foresight workshop on reserarch and
innovation, October 5, 2011, Trondheim



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Scenario: The soil is dying. The humus content and the soil life is reduced each year world wide. Soil fertility is declining. Soil erosion and soil compaction follows. Diseases in plants, animals and man become more and more common and cannot be controlled. The yield of important food plants are declining despite of heavy use of artificial fertilizer and chemicals.

False/true	Reaction	
	We take steps	We do not take steps
False	Unnecessary costs to society and the farmers due to: -implementation of national measures like regulations and so forth. -grants to the farmer - not necessary research and development costs	Well, we have not initiated anything and not have unnecessary costs! Anyone can smile and be happy!
True	Then the costs have been justified and all can smile and be happy!	A very sad scenario. Cultivated land "gives" up. National production sinks more and more. Dependence on imports increases, but the problem is that the degeneration of cultivated land has gone as far in other countries - that is, in other words, maybe not so much to buy. Erosion at unimagined heights. The entire social structure may collapse.





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MINISTRY OF
AGRICULTURE AND FOOD



Statens landbruksforvaltning
Norwegian Agricultural Authority

Lindum Ltd:

Leading innovative and value-creating waste treatment – for the environment.

County
Governor in
Buskerud
Project leader

VitalAnalyse



Bioforsk
organic

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Main goals:

- > Raise awareness about the importance of fertile, living soil among farmers and non-farmers
- > Make suggestions and try out practical ways to restore the soil food web and thereby restore soil fertility
- > To be a spearhead for turning the ordinary agriculture in a more environmentally friendly direction

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“Our welfare is inextricably linked to the Soil's welfare. Our destiny is inextricably linked to the fate of the Soil”



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It is estimated that about 75 billions tonnes of soil is lost annually with more than 80% of the world farming land is moderately or severe eroded....

Chronic soil mismanagement and over farming causing erosion, climate change and increasing populations is said to be blamed for the dramatic global decline in suitable farming soil.

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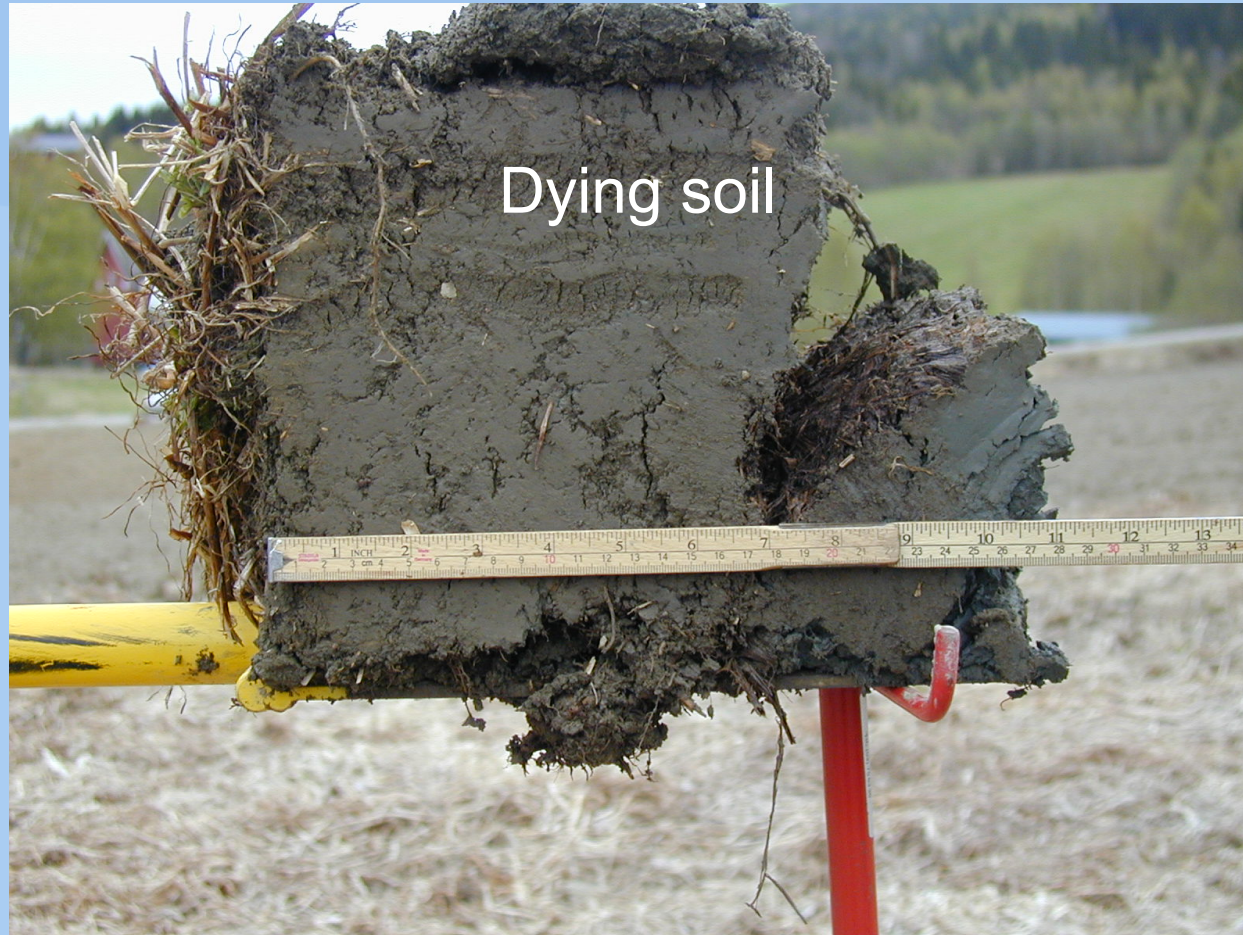
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The main characteristic of Nature`s farming can be summed up in few words:

- >Mother earth never attempts to farm without live stock
- >She always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion
- >The mixed vegetable and animal wastes are converted into humus
- >There is no waste; the proses of growth and the proses of decay balance each other
- >Ample provision is made to maintain large reserves of fertility;
- >The greatest care is taken to store rainfall
- >Both plants and animals are left to protect themselves against disease





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What is a fertile soil?

That is a soil rich in humus teeming with healthy life in the shape of abundant microflora and microfauna. It will bear healthy plants, and these, when consumed by animals and man, will confer health on animals and man.

What is an infertile soil?

That is a soil lacking humus and lacking sufficient microbial, fungus, and other life. An infertile soil will pass on some form of deficiency to the plant, and such plant, in turn, will pass on some form of deficiency to animal and man.





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Microorganism in soil

Organisms	Agricultural soil	Agricultural soil, roots	Natural soil	Natural soil, roots
Total Bacteria (number/gram dry soil)	1×10^6	1×10^{12}	6×10^8	1×10^{12}
Bacteria species g jord	5000	5000	75000	75000
Total Fungi(ug pr g dry soil)	5	20	150	300 – 500
Fungi species g jord	500	?	25000	25000
VAM symbiose	0	0	55%	55%

Elaine Ingham, SFI, USA

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What can we do to restore an infertile soil?

”The law of return”



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Organism numbers after compost addition

Organism Assays	Agricultural Field	Compost (1ton/ac)	Ag soil with compost
Total bacteria (#/gram dry soil)	1×10^6	6×10^9	17×10^8
# of bacterial species/g soil	5,000	25,000	25,000
Total fungi (ug per g dry soil)	5	150	500
# of fungal species /g soil	500	8,000	8,000
F, A C	0, 0 1,450	12,000, 31,000 29	6,000, 17,000 67

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