Convegno finale del progetto RETIBIO:
- terza circolare -

Reti in BIO: condivisione di percorsi, confronto e dialogo per la crescita dell'agricoltura biologica

Roma, 13 e 14 marzo 2018

L'approccio agroecologico per l'agricoltura biologica sostenibile

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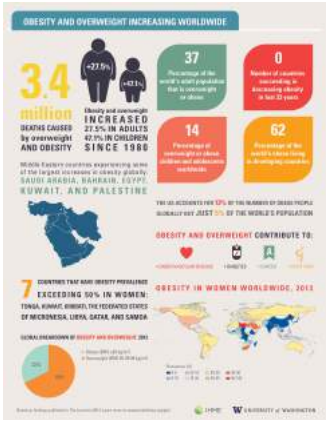
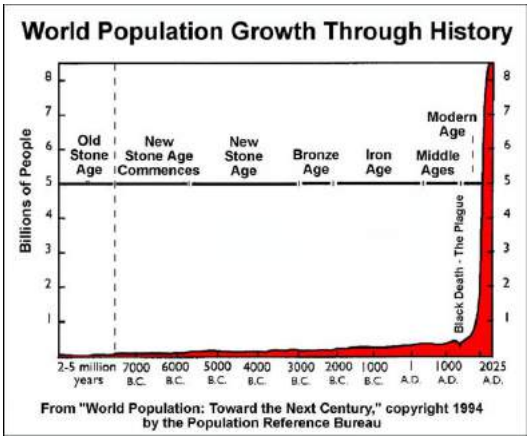
President of Agroecology Europe
Vice-president IFOAM Agribiomediterraneo
p.migliorini@unisg.it

06/04/18 PM

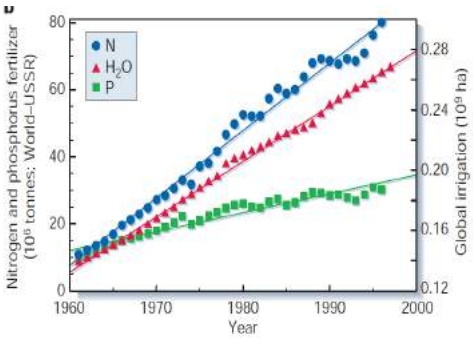
IFOAM Agribiomediterraneo http://www.ifoam.bio/en/regional-bodies/ifoam-agribiomediterraneo,

Lo stato della salute globale sta peggiorando



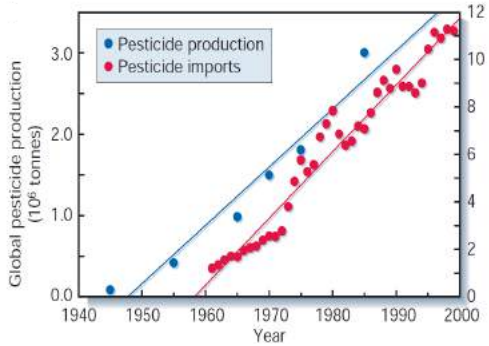


Global Agriculture: Input Use



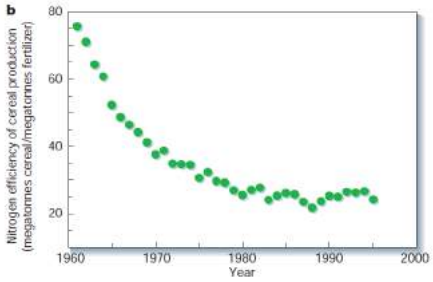
David Tilman, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor & Stephen Polasky (2002) Agricultural sustainability and intensive production practices. Nature 418

Global Agriculture: Input Use



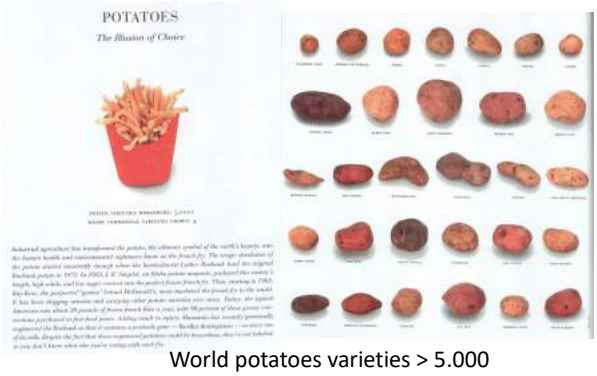
David Tilman, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor & Stephen Polasky (2002) Agricultural sustainability and intensive production practices. Nature 418

Global Agriculture: Input (N) Efficiency



David Tilman, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor & Stephen Polasky (2002) Agricultural sustainability and intensive production practices. Nature 418

Loss of agobiodiversity

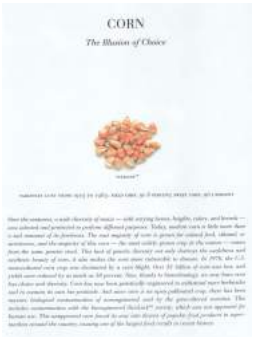


World potatoes varieties > 5.000
Commercial varieties: 4

Loss of agobiodiversity

Loss of varieties from 1903 to 1983: 86%

Loss of agobiodiversity

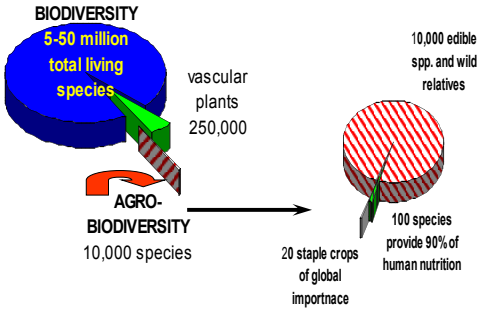


Loss of varieties from 1903 to 1983: 91%

Loss of agobiodiversity

Loss of varieties from 1903 to 1983: 83%

Biodiversity and Agrobiodiversity



World Food Production

TABLE 4: **Top five items produced in 2013, thousand tonnes**

	2000	2013
Sugar cane	1 256 380	1 877 110
Maize	592 479	1 016 740
Rice, paddy	599 355	745 710
Wheat	585 691	713 183
Potatoes	327 600	368 096

(Souces FAO)

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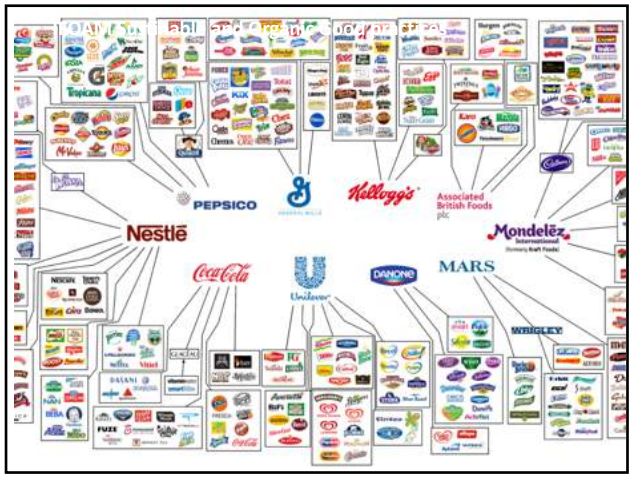
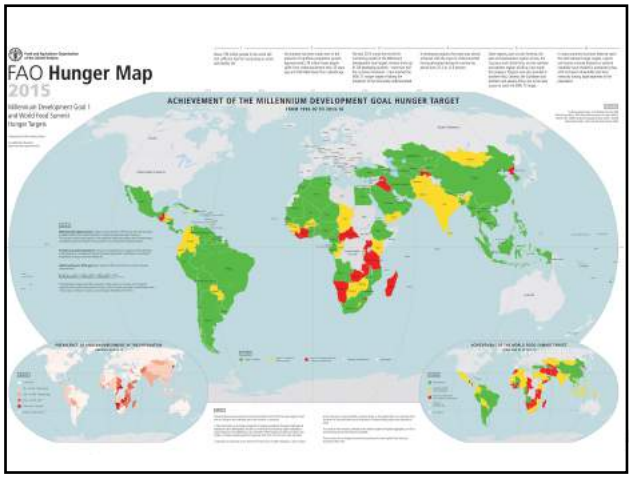
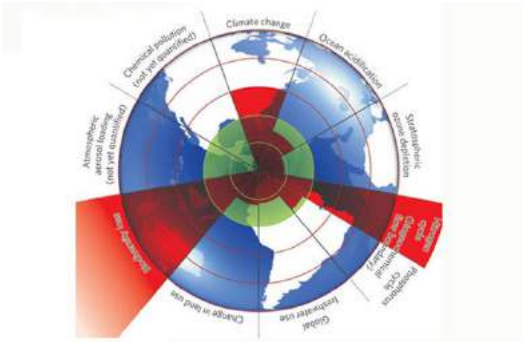


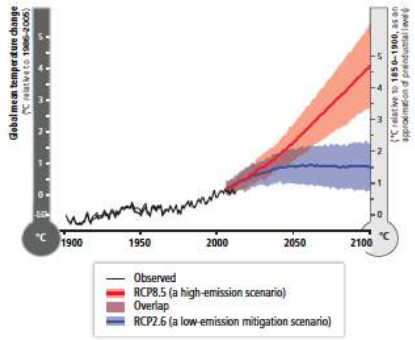


Limiti Planetari



Rockström et al. 2009 A safe operating space for humanity. *Nature* **461**, 472-475

EFFECT OF CLIMATE CHANGE



IPCC (2014). Climate Change 2014. Synthesis Report.

EFFECT OF CLIMATE CHANGE IN THE MED AND IN ITALY

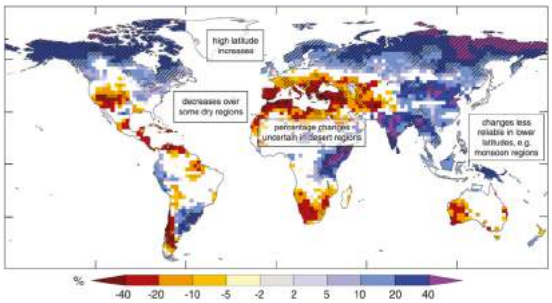
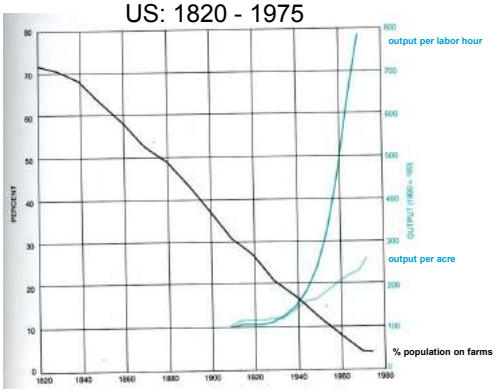


Figure 1. Percentage changes in average annual runoff projected by four climate models for the period 2090-2099, relative to 1980-1999 Source: IPCC. 2007. Climate Change 2007: Synthesis Report. Intergovernmental Panel on Climate Change. Figure 3.5, p. 49.

Social sustainability: labour & human right

US: 1820 - 1975



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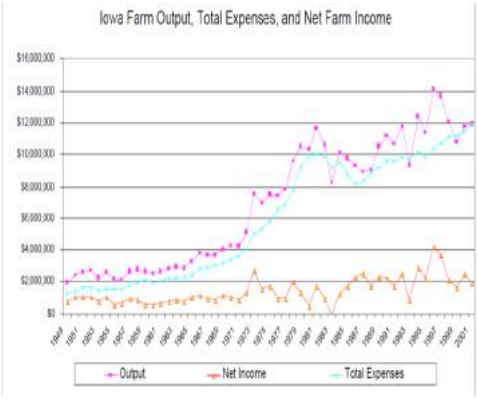

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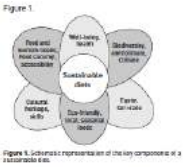
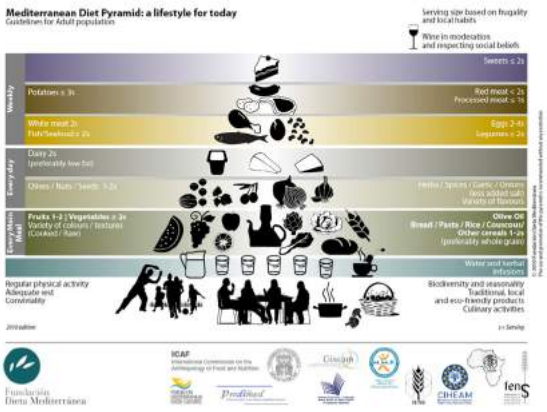
C'è la necessità di un'agricoltura, di sistemi alimentari e diete più sostenibili

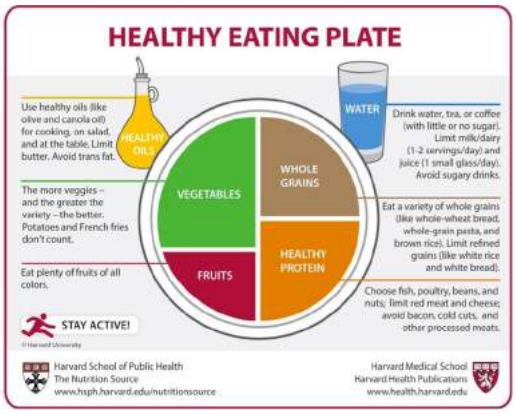
Diete Sostenibili

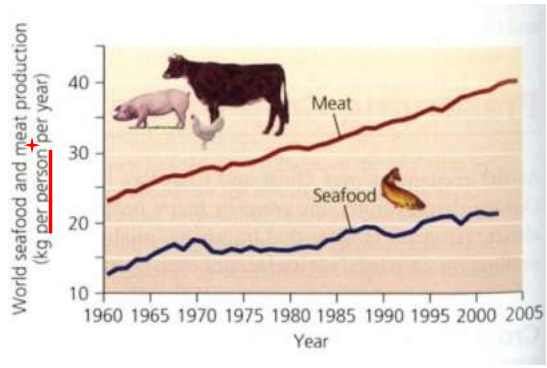
"Le diete sostenibili sono quelle diete a basso impatto ambientale che contribuiscono alla sicurezza alimentare e nutrizionale e alla vita sana per le generazioni presenti e future. Le diete sostenibili sono protettive e rispettose della biodiversità e degli ecosistemi, culturalmente accettabile, economicamente equo e accessibile; nutrizionalmente adeguata, sano e sicuro; ottimizzando le risorse naturali e umane ".
(FAO, 2010)



Denis Lairon
President, Federation of European Nutrition Societies
INRA, UMR 1260 & INSERM, ERL 1025
University Aix -Marseille, Marseille, France



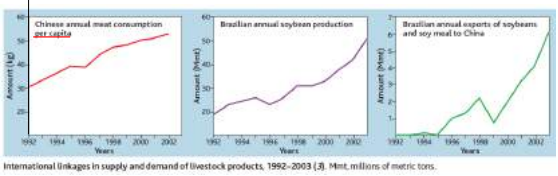




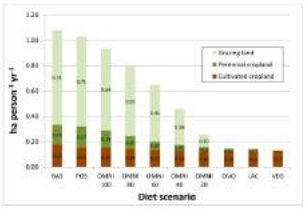
Growing Plants to Feed Animals - Global

- Meat consumption increases with income
- To feed whole world a Western diet would require ~1.7X amount of land now farmed
- Soybean acreage in Brazilian cerrado and rainforest *doubled* in 10 years;
- May *triple* again →major impacts on biodiversity, climate, soil and water systems

= approximate US meat consumption level



International linkages in supply and demand of livestock products, 1992–2003 (3). Mmt, millions of metric tons.



Christian J. Peters, Jamie Picardy, Amelia F. Darrouzet-Nardi, Jennifer L. Wilkins, Timothy S. Griffin, Gary W. Fick (2016) **Carrying capacity of U.S. agricultural land: Ten diet scenarios.** *Elementa: Science of the Anthropocene*, 4:000116, doi: 10.12952/journal.elementa.000116

Table 1. Scenarios for the land requirements of diet analysis of the U.S.

Group	Description	Name	Symbol	Key attributes
Current consumption	Based on USDA estimates of per capita loss-adjusted food availability.	Baseline	BAS	Food intake equals loss-adjusted food availability for individual food commodities.
		Positive control	POS	An above-average intake of fats and sweeteners is reduced to make diet energy-balanced.
Healthy diet, omnivorous	Complies with 2010 Dietary Guidelines for Americans, includes some of both.	100% healthy omnivorous	OMNI 100	100% of person-meals follow an omnivorous healthy diet pattern and 0% follow a zero-focus vegetarian healthy diet pattern.
		80% healthy omnivorous	OMNI 80	80% of person-meals follow an omnivorous healthy diet pattern and 20% follow a zero-focus vegetarian healthy diet pattern.
		60% healthy omnivorous	OMNI 60	60% of person-meals follow an omnivorous healthy diet pattern and 40% follow a zero-focus vegetarian healthy diet pattern.
		40% healthy omnivorous	OMNI 40	40% of person-meals follow an omnivorous healthy diet pattern and 60% follow a zero-focus vegetarian healthy diet pattern.
		20% healthy omnivorous	OMNI 20	20% of person-meals follow an omnivorous healthy diet pattern and 80% follow a zero-focus vegetarian healthy diet pattern.
Healthy diet, vegetarian	Complies with 2010 Dietary Guidelines for Americans.	Ovolacto vegetarian	OVO	Includes both eggs and dairy products.
		Lacto vegetarian	LAC	Includes dairy products. Excludes eggs.
	Excludes animal flesh.	Vegan	VEG	Excludes all livestock products.

doi: 10.12952/journal.elementa.000116

Organic food provides significant environmental benefits to plant-rich diets

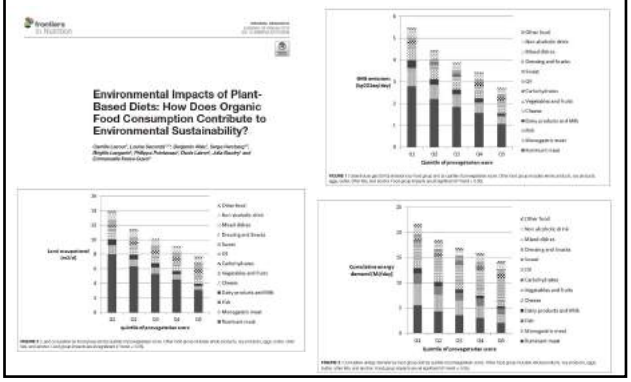


TABLE 4 | Association between provegetarian score tertile and environmental impacts according to the level of organic food consumption, BioNutriNet study, 2014.

	Overall		Level of contribution of organic food to the diet					
			Low (0.03)		Medium (0.22)		High (0.63)	
	Mean*	95% CL	Mean*	95% CL	Mean*	95% CL	Mean*	95% CL
Greenhouse gas emissions (CO2eq/day)								
Q1 provegetarian score	2.62	(4.51–4.6)	4.59	(4.53–4.65)	4.56	(4.48–4.63)	4.10	(3.99–4.22)
Q2 provegetarian score	3.33	(4.01–4.08)	4.13	(4.06–4.19)	4.05	(4–4.1)	3.74	(3.66–3.81)
Q3 provegetarian score	3.06	(3.02–3.09)	3.73	(3.68–3.78)	3.68	(3.63–3.74)	3.34	(3.28–3.41)
Q4 provegetarian score	1.89	(3.2–3.27)	3.46	(3.39–3.51)	3.38	(3.33–3.43)	2.94	(2.89–2.99)
Q5 provegetarian score	1.32	(2.27–1.33)	2.89	(2.87–2.99)	2.72	(2.67–2.73)	2.12	(2.09–2.14)
P* interaction								<0.0001
P* Q1 vs Q2								0.9711
P* Q1 vs Q3								0.2166
P* Q1 vs Q4								<0.0001
P* Q1 vs Q5								<0.0001
Cumulative energy demand (MJ/day)								
Q1 provegetarian score	19.67	(16.43–19.67)	19.68	(19.4–19.75)	19.58	(19.39–19.73)	17.33	(17.06–17.53)
Q2 provegetarian score	19.02	(17.33–17.53)	17.62	(17.47–17.77)	17.47	(17.32–17.62)	16.53	(16.32–16.73)
Q3 provegetarian score	9.49	(16.52–16.58)	16.87	(16.7–17.04)	16.62	(16.47–16.78)	15.59	(15.41–15.77)
Q4 provegetarian score	8.98	(15.52–15.73)	16.42	(16.21–16.63)	16.10	(15.93–16.27)	13.63	(14.45–14.78)
Q5 provegetarian score	7.64	(13.21–13.37)	15.56	(15.33–15.79)	14.72	(14.56–14.89)	12.66	(12.56–12.76)
P* interaction								< 0.0001
P* Q1 vs Q2								0.5417
P* Q1 vs Q3								0.1044
P* Q1 vs Q4								<0.0001
P* Q1 vs Q5								<0.0001
Land occupation (m²/day)								
Q1 provegetarian score	9.51	(11.21–1.14)	10.94	(10.79–11.1)	11.58	(11.39–11.78)	11.66	(11.36–11.96)
Q2 provegetarian score	5.90	(10.17–10.35)	9.89	(9.76–10.03)	10.31	(10.17–10.45)	10.64	(10.45–10.85)
Q3 provegetarian score	5.37	(9.26–9.42)	8.56	(8.81–9.00)	9.43	(9.29–9.57)	9.81	(9.44–9.79)
Q4 provegetarian score	4.89	(8.42–8.6)	8.26	(8.1–8.43)	8.08	(8.64–8.93)	8.50	(8.56–8.65)
Q5 provegetarian score	3.81	(6.57–6.69)	7.09	(6.97–7.19)	7.09	(6.97–7.21)	6.49	(6.41–6.57)
P* interaction								<0.0001
P* Q1 vs Q2								0.7752
P* Q1 vs Q3								0.9690
P* Q1 vs Q4								0.0113
P* Q1 vs Q5								<0.0001

Feeding the planet…

- Reducing meat consumption and food waste will permit to feed the world organically with less land than the current 'land sparing' model
- Nitrogen

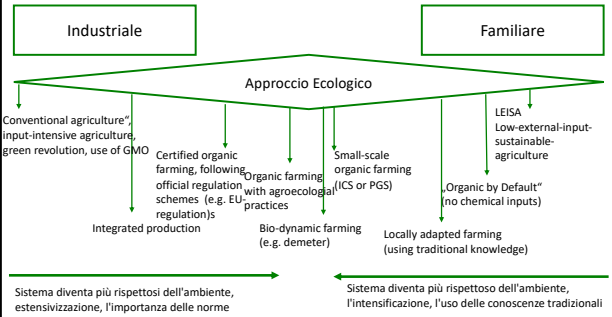
Enought food for 10 billion : stop food waste

Economic cost of loss of production	1.0 trillion US$
Enviromental cost	0,7 trillion US$
Social cost	0,9 trillion US$
Total	2,6 trillion US$

3-4% of the gross global product

www.fao.org/publication

Sistemi agricoli



Source: Susanne Kummer, 2008 BOKU

L'approccio

"Le differenze tra i paradigmi tradizionali e sostenibili di agricoltura sono molto più una questione di differenze di principi filosofici che di pratiche agricole o metodi. (..).

Ikerd, J.E. The need for a systems approach to sustainable agriculture *Agriculture, Ecosystems and Environment*, **1993**, 46: 147-160.

Nuovi paradigmi Convenzionale / Alternativo (Khun, 1970)

·Dominazione della natura	·Armonia con la natura
·Specializzazione	·Diversità
·Sfruttamento	·Moderazione

Livello Ambientale/Ecologico

·Centralizzazione	·Decentralizzazione
·Dipendenza	·Indipendenza
·Competizione	·Comunità

Livello economico/strutturale

Curtis E. Beus and Riley E. Dunlap (1990) Conventional versus Alternative Agriculture: The Paradigmatic Roots of the Debate, Rural Sociology, V.55(4):590–616

36

Agroecologia

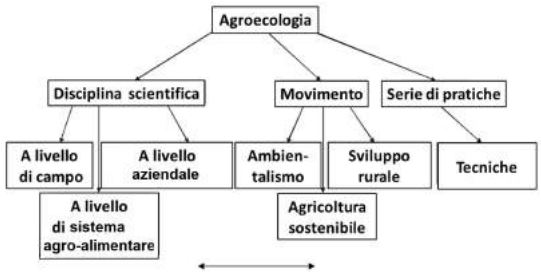
Table I. Important works in the history of Agroecology (adopted from Gliessman, 2007).

Year	Author	Title
1928	Bensin	Agroecological characteristics description and classification of the local corn variation chorotypes[1]
1928	Klages	Crop ecology and ecological crop geography in the agronomic curriculum[2]
1930	Bensin	Possibilities for international cooperation in agroecological investigations[2]
1930	Friederichs	Die Grundfragen und Gesetzmäßigkeiten der land- und forstwirtschaftlichen Zoologie[1]
1938	Papadakis	Compendium on crop ecology
1939	Hanson	Ecology in agriculture[2]
1942	Klages	Ecological crop geography[1]
1950	Tüchler	Ergebnisse und Probleme der Agrarökologie[2]
1956	Azzi	Agricultural ecology[1]
1965	Tüchler	Agrarökologie[1]
1967	Hérdin	Les acquisitions techniques en production végétale et leurs applications[2]
1973	Janzen	Tropical agroecosystems[2]
1976	INTECOL	Report on an International Programme for analysis of agro-ecosystems[3]
1978	Gliessman	Memorias del Seminario regional sobre la agricultura agricola tradicional[3]
1979	Cox and Atkins	Agricultural ecology: an analysis of world food production systems[1]
1981	Gliessman et al.	The ecological basis for the application of traditional agricultural technology in the management of tropical agroecosystems[2]
1983	Altieri	Agroecology[1]
1984	Douglass (ed.)	Agricultural sustainability in a changing world order[1]
1987	Arrigoni	Agro-écologie des zones arides et sub-humides[1]
1987	Conway	The properties of agroecosystems[2]
1989a	Altieri	Agroecology: A new research and development paradigm for world agriculture[2]
1990	Gliessman (ed.)	Agroecology: researching the ecological basis for sustainable agriculture[1]
1991	Caporali	Ecologia per l'agricoltura[1]
1995	Altieri	Agroecology: the science of sustainable agriculture (2nd edition)[1]
1997	Gliessman	Agroecology: ecological processes in sustainable agriculture[1]
2003	Dalgaard et al.	Agroecology, scaling and interdisciplinarity[2]
2003	Francis et al.	Agroecology: the ecology of food systems[2]
2004	Clements and Shrestha (eds.)	New dimensions in agroecology[1]
2007	Gliessman	Agroecology: the ecology of sustainable food systems[1]
2007a	Wezner	Agroecology in action: extending alternative agriculture through social networks[1]

[1] Book.
[2] Journal article.
[3] Conference proceedings or report.

Sources: Wezel et al. 2009

Agroecologia



Sources: Wezel et al. 2009

Historical evolution of definitions of Agroecology

Altieri 1989:
A scientific approach used to study, diagnose and propose alternative low-input management of agroecosystems

Altieri 1995:
A discipline that provides the basic ecological principles for how to study, design and manage agroecosystems that are both productive and natural resource conserving, and that are also culturally sensitive, socially just and economically viable

Gliessman 1998:
The application of ecological concepts and principles to the design and management of sustainable agroecosystems

Francis et al. 2003:
The integrative study of the ecology of the entire food systems, encompassing ecological, economic and social dimensions

Gliessman 2007:
The science of applying ecological concepts and principles to the design and management of sustainable food systems

Wezel et al. 2009:
Agroecology, is science, movement, and practice

Sources: Wezel et al. 2009

Agroecology Europe
Our understanding of Agroecology

Agroecology is considered jointly as a science, a practice and a social movement.
It encompasses the whole food system from the soil to the organization of human societies. It fosters interactions between actors in science, practice and movements, by facilitating knowledge sharing and action

As a **science**, it gives priority to action research, holistic and participatory approaches, and transdisciplinarity that is inclusive of different knowledge systems.
As a **practice**, it is based on sustainable use of local renewable resources, local farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global.
As a **movement**, it defends smallholders and family farming, farmers and rural communities, food sovereignty, local and short food supply chains, healthy and quality food.

http://www.agroecology-europe.org/our-approach/our-understanding-of-agroecology/.

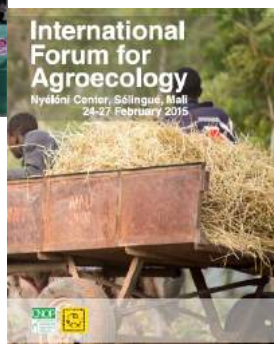
AGROECOLOGY EUROPE
www.agroecology-europe.org

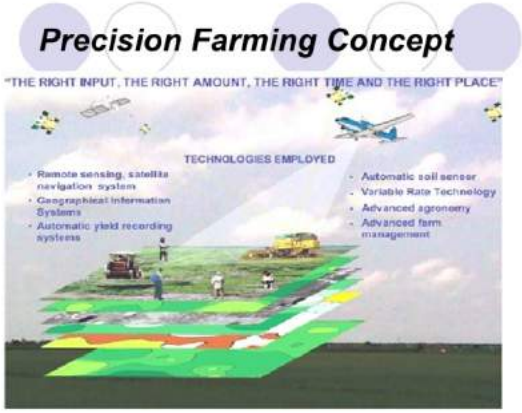
Fondazione nel gennaio 2016: 19 fondatori provenienti da 10 paesi
Associazione europea per promuovere l'agroecologia

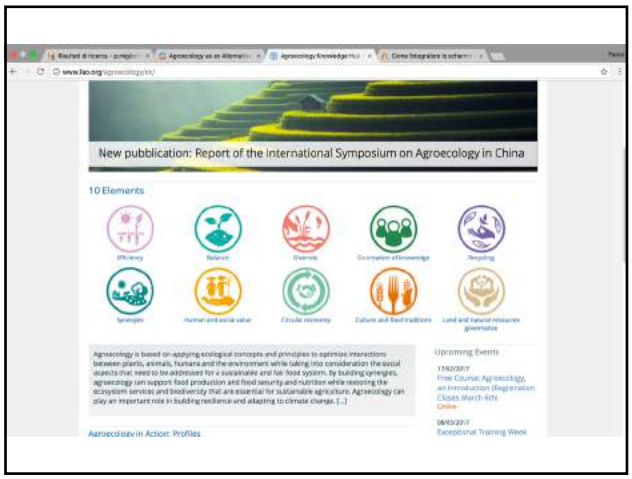
MISSION

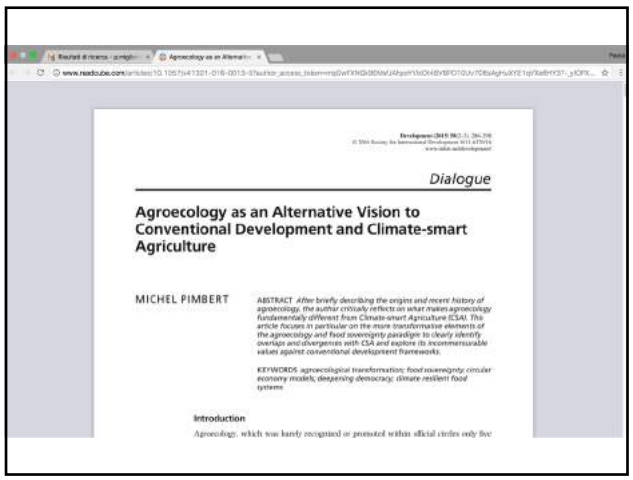
L'Associazione si propone di porre l'agroecologia in cima all'agenda europea di sviluppo sostenibile dei sistemi agricoli e alimentari.

Essa intende favorire le interazioni tra gli attori nel campo della scienza, la pratica e movimenti sociali, facilitando la condivisione della conoscenza e di azione comune.









Dialogue

Agroecology as an Alternative Vision to Conventional Development and Climate-smart Agriculture

MICHEL PIMBERT

ABSTRACT *After briefly describing the origins and recent history of agroecology, the author critically reflects on what makes agroecology fundamentally different from Climate-smart Agriculture (CSA). This article focuses in particular on the more transformative elements of the agroecology and food sovereignty paradigm to clearly identify overlaps and divergences with CSA and explore its incommensurable values against conventional development frameworks.*

KEYWORDS *agroecological transformation; food sovereignty; circular economy models; deepening democracy; climate resilient food systems*

Introduction

Agroecology, which was barely recognized or promoted within official circles only five

REGULATIONS
Council Regulation (EC) No 834/2007
of 28 June 2007
on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91

(1) L'agricoltura biologica è un sistema globale di gestione dell'azienda agricola e di produzione agroalimentare basato sull'interazione tra le migliori pratiche ambientali, un alto livello di biodiversità, la conservazione delle risorse naturali, l'applicazione di standard di benessere degli animali e di un metodo di produzione in linea con la preferenza di taluni consumatori per prodotti ottenuti con sostanze e procedimenti naturali. Il metodo di produzione biologico esplica pertanto una duplice funzione sociale, dove da un lato prevede un mercato specifico che **risponde a una domanda dei consumatori** per i prodotti biologici, e d'altra parte **fornisce beni pubblici** che contribuiscono alla tutela del benessere degli animali e, così come allo sviluppo rurale.

Comprendere l'agricoltura biologica

"L'agricoltura biologica è un sistema di produzione che sostiene la salute dei suoli, degli ecosistemi e delle persone. Essa si basa sui processi ecologici, sulla biodiversità e su cicli adattati alle condizioni locali, piuttosto che sull'uso di input esterni con effetti avversi. Agricoltura Biologica unisce tradizione, l'innovazione e la scienza a beneficio dell'ambiente condiviso e promuovere i rapporti equi e una buona qualità della vita per tutti i soggetti coinvolti."

(IFOAM, 2007)

L'agricoltura biologica è più della necessità di soddisfare la domanda del mercato

IFOAM
INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS

HEALTH ECOLOGY FAIRNESS CARE

(IFOAM, 2008)

PRINCIPI *dell'* AGRICOLTURA BIOLOGICA

PREAMBOLO

Questi Principi sono le radici a partire dalle quali cresce e si sviluppa l'agricoltura biologica. Essi esprimono il contributo che l'Agricoltura Biologica può apportare al mondo ed esprimono una visione per migliorare tutta l'agricoltura nel contesto internazionale.

L'agricoltura è una delle attività umane più basilari, perché tutte le persone devono nutrirsi ogni giorno. La storia, la cultura ed i valori delle comunità sono legati all'agricoltura.

Questi principi riguardano l'agricoltura nel senso più ampio, che comprende il modo in cui l'uomo si occupa della terra, dell'acqua, delle piante e degli animali per produrre, preparare e distribuire cibo ed altri beni. Essi riguardano il modo in cui le persone interagiscono con paesaggi vivi, si rapportano l'uno con l'altro e formano l'eredità per le generazioni future.

I principi dell'agricoltura biologica servono ad ispirare il movimento biologico in tutta la sua diversità. Essi guidano le prese di posizione, i programmi e le regole elaborate da IFOAM. Essi, inoltre, vengono presentati con la prospettiva di un'adozione nel mondo intero.

HEALTH ECOLOGY FAIRNESS CARE

PRINCIPI *dell'* AGRICOLTURA BIOLOGICA

Il principio del BENESSERE

L'Agricoltura Biologica dovrà sostenere e favorire il benessere del suolo, delle piante, degli animali, degli esseri umani e del pianeta, come un insieme unico ed indivisibile.

Il principio dell' ECOLOGIA

L'Agricoltura Biologica dovrà essere basata su sistemi e cicli ecologici viventi, lavorare con essi, imitarli ed aiutarli a mantenersi.

HEALTH ECOLOGY FAIRNESS CARE

Il principio dell' EQUITÀ

L'Agricoltura Biologica dovrà costruire relazioni che assicurino equità rispetto all'ambiente comune e alle opportunità di vita.

Il principio della PRECAUZIONE

L'Agricoltura Biologica dovrà essere gestita in modo prudente e responsabile, al fine di proteggere la salute ed il benessere delle generazioni presenti e future, nonché l'ambiente.

OA in the world

OA in the world is in rapid development:

- in 179 countries there are organic crops
- 50.9 million hectares (Austalia, Argentina and USA)
- 2.4 million farmers: India (650'000), Ethiopia (203'600), Uganda (190'552) and Mexico (200'039)
- The market turnover is 80 billionUS $: the United States is the market leader (35.9 B $), followed by Germany (8.6), France (5.5) and China (4.7)
- Consumers buying more organic products are Swiss with 262 euros per year and Denmark with 9% of the organic bio market at the tot.

Willer et al. (2018) The world of organic agriculture 2018

53

Sistema dominante

- Nelle Alpi Svizzere il 63% delle terre sono bio
- Nello Stato di Salisburgo (Austria) 49%

Agronomicamente e socio-economicamente adattato?

Nicchia

Necessita innovazione

Necesssita di cambio politico

- Nei sistemi produttivi intensi OA è inferiore all'1%

Tecnicamente immaturo?
Economicamente non competitivo?
Nessuna vera contabilità dei costi?

Sostenibilità dell'AB

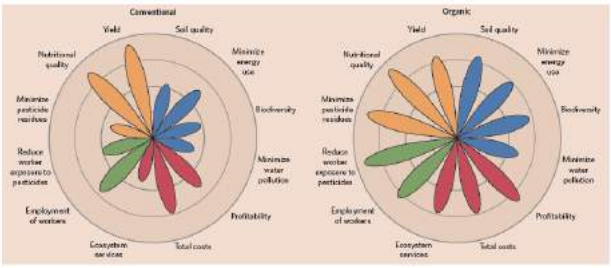
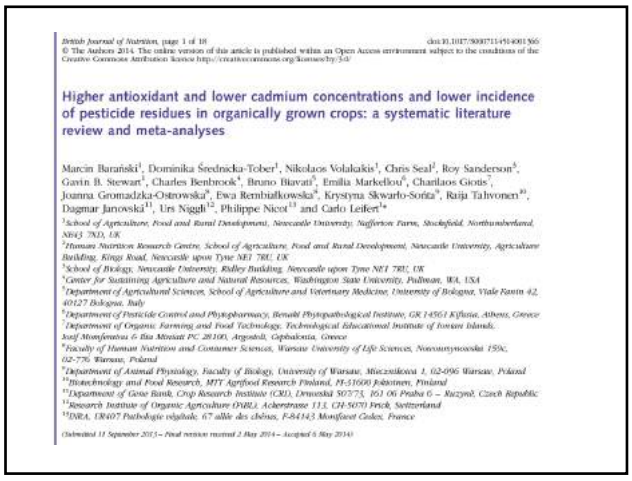


Figure 4 | Assessment of organic farming relative to conventional farming in the four major areas of sustainability. Lengths of the 12 flower petals are qualitatively based on the studies discussed in this Review[4–24,26–29,32–36,38,42–79] and indicate the level of performance of specific sustainability metrics relative to the four circles representing 25, 50, 75 and 100%. Orange petals represent areas of production; blue petals represent areas of environmental sustainability; red petals represent areas of economic sustainability; green petals represent areas of wellbeing. The lengths of the petals illustrate that organic farming systems better balance the four areas of sustainability.

John P. Reganold and Jonathan M. Wachter (2015) Organic agriculture in the twenty-first century. Nature Plants, 15221. DOI: 10.1038

Sostenibilità forte dell'agricoltura biologica nel Mediterraneo

- Multifunzionalità
- Incremento della biodiversità e risorse genetiche
- Tutela delle risorse naturali: suolo, acqua, aria
- Riduzione degli input esterni e di energia non rinnovabile
- Sui cambiamenti climatici: mitigazione e resilienza
- La ricerca di sistemi alternativi di mercato
- Sviluppo rurale sostenibile
- Diminuzione delle perdite alimentari e rifiuti
- Qualità del prodotto e la salute



British Journal of Nutrition, page 1 of 18 doi:10.1017/S0007114514001366

Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: a systematic literature review and meta-analyses

Marcin Barański[1], Dominika Średnicka-Tober[1], Nikolaos Volakakis[1], Chris Seal[2], Roy Sanderson[3], Gavin B. Stewart[4], Charles Benbrook[5], Bruno Bavati[6], Emilia Markellou[7], Charilaos Giotis[7], Joanna Gromadzka-Ostrowska[8], Ewa Rembiałkowska[9], Krystyna Skwarło-Sońta[9], Raija Tahvonen[10], Dagmar Janovská[11], Urs Niggli[12], Philippe Nicot[13] and Carlo Leifert[1]*

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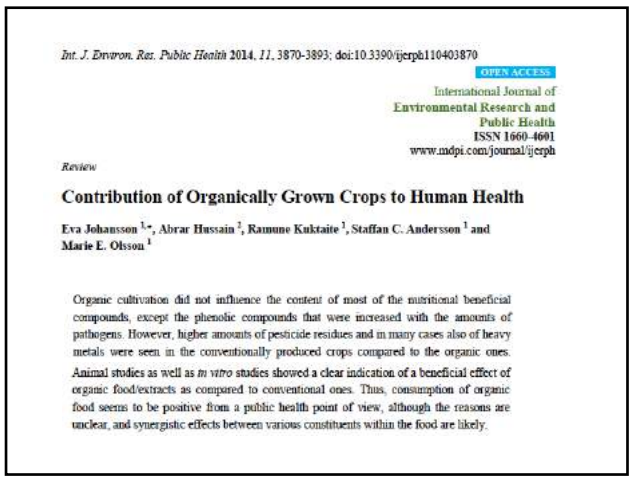
(Submitted 11 September 2013 – Final revision received 2 May 2014 – Accepted 6 May 2014)



Int. J. Environ. Res. Public Health 2014, *11*, 3870-3893; doi:10.3390/ijerph110403870

OPEN ACCESS

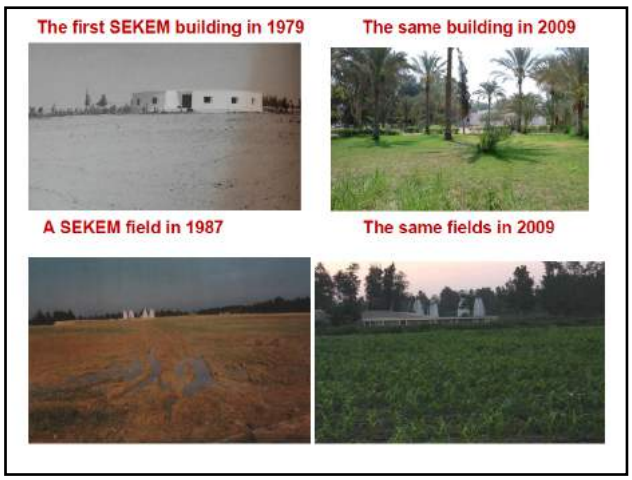
International Journal of Environmental Research and Public Health
ISSN 1660-4601
www.mdpi.com/journal/ijerph

Review

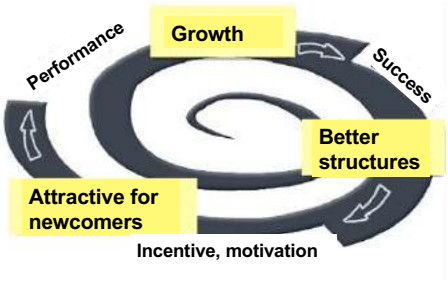
Contribution of Organically Grown Crops to Human Health

Eva Johansson [1,*], Abrar Hussain [2], Ramune Kuktaite [1], Staffan C. Andersson [1] and Marie E. Olsson [1]

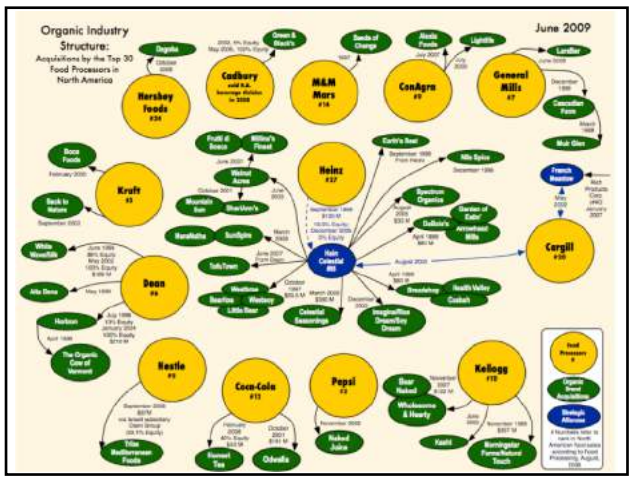
Organic cultivation did not influence the content of most of the nutritional beneficial compounds, except the phenolic compounds that were increased with the amounts of pathogens. However, higher amounts of pesticide residues and in many cases also of heavy metals were seen in the conventionally produced crops compared to the organic ones. Animal studies as well as *in vitro* studies showed a clear indication of a beneficial effect of organic food/extracts as compared to conventional ones. Thus, consumption of organic food seems to be positive from a public health point of view, although the reasons are unclear, and synergistic effects between various constituents within the food are likely.

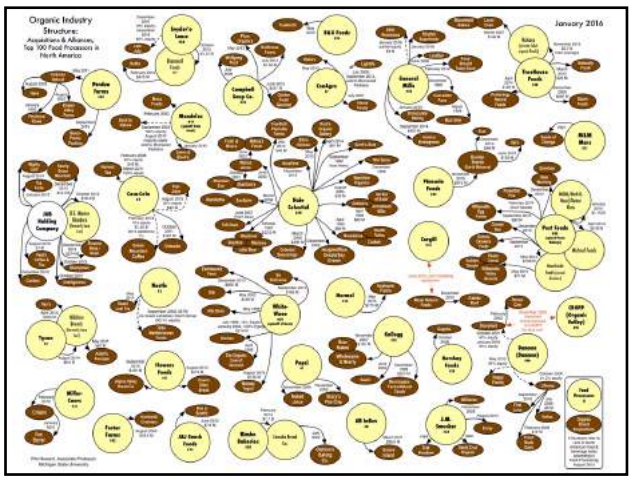


Il processo si rafforza



Crescita = Conventionalizzazione?





Steps towards sustainability

- Diversify crops and animal enterprises
- Substitute ecological management for off-farm inputs (agrochemicals, fuel, etc)
- Maximize use and recycling of on-farm resources
- conserve soil, water and genetic diversity
- reduce energy use (machinery, equipment) and keep costs down
- Favor direct and local marketing

Migliorini, Peeters, Barberi, Wezel
Agroecology in Europe
Brussels on 11 January 2018
DG Environment

Agroecological practices

Some examples of agroecological cropping practices using biodiversity and diversification

→ Practices that relate to nature based solutions mentioned among needed innovations in agriculture (EU CAP communication 2017)

Ecological strategy of Agroecology

- Replacing fossil fuels by ecosystem services provided by biodiversity
- Investing in biodiversity at all levels

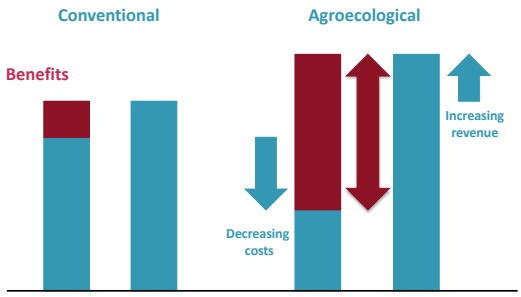
Peeters 2017

Ecological strategy of Agroecology

- Relying on local resources and system approach
  - = endogenous soil fertility
  - no massive use of commercial inputs
- Intensive in observations, thinking and knowledge

Peeters 2017

Economic strategy of Agroecology



Peeters 2017

Shoot for the moon. Even if you miss, you'll land among the stars! Oscar Wilde

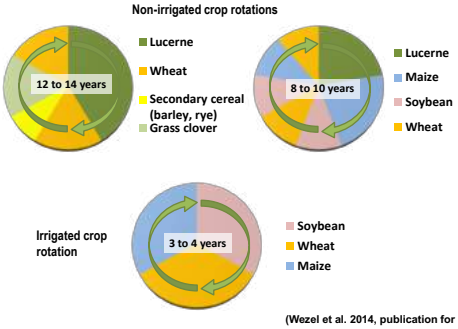
Table 2. Agroecological cropping practices, scale of application, level of system change, and integration in today's agriculture in Europe.

Agroecological practice	Scale of application[1]	Level of system change needed	Level of integration in today's agriculture	Potential for the next decade
Efficiency increase and substitution practices				
Crop choice, crop spatial distribution and crop temporal succession				
Cultivar choice	practice	low	high	high
Crop fertilisation				
Split fertilisation	practice, system	low	high	high
Biofertilizer	practice	low	low	medium
Organic fertilisation	practice, system	medium	medium	medium
Crop irrigation				
Drip irrigation	practice	high	medium	high
Weed, pest and disease management				
Natural pesticides	practice	low	low	medium
Biological pest control	system	medium	medium	high
Redesign practices				
Crop choice, crop spatial distribution and crop temporal succession				
Crop choice and rotations	system	medium	low	high
Intercropping and relay intercropping	practice, system	high	low	medium
Agroforestry with timber, fruit or nut trees	system	high	low	low
Weed, pest and disease management				
Allelopathic plants	practice, system	low	low	medium
Tillage management				
Direct seeding into living cover crops or mulch	system, practice	high	low	low/medium
Reduced tillage	system, practice	high	medium	medium/high

Sources: Wezel et al. 2014

Diversified crop rotations

Typical crop rotations in organic cereal farms in SE France.



(Wezel et al. 2014, publication for FAO)

1st step: Developing the ecological network

Peeters 2017

Cover crops and green manuere

Mustard cover crop (France)

http://www.ipm.ucdavis.edu/IPMPROJECT/2007/strategicplan.html

Mustard helps also to reduce nematode populations (biological pest control)

(Wezel et al. 2014, publication for FAO)

Cultivar mixtures

Wheat cultivar mixtures
(Photo B. Rolland, INRA)

Rice cultivar
mixtures in China

(Wezel et al. 2014, publication for FAO)

MAIS (Zea mays)

Intercropping

Pea and wheat intercropping in western France (Photo G. Corre-Hellou).

Relay intercropping of wheat and undersown lucerne in SE France.

Relay intercropping of wheat and undersown clover in SE France (Photo F. Boissinot).

(Wezel et al. 2014, publication for FAO)

Direct seeding, seeding into cover-crops

(Photo J. Peigné, France)

(Photo E. Silva, USA)

(Wezel et al. 2014, publication for FAO)

Integration of semi-natural landscape elements at field, farm or landscape scale

Conservation biological control – Pollination - Biodiversity conservation,

(Wezel et al. 2014, publication for FAO)

Management of landscape elements

Biological control, pollinisation, erosion, drinking water protection, biodiversity conservation

(Wezel et al. 2014, publication for FAO)

Miguel Altieri 2005

Miguel Altieri 2005

Miguel Altieri 2005

Miguel Altieri 2005

Miguel Altieri 2005

Miguel Altieri 2005

Natural enemies of crop pests

Coccinellidae (ladybirds/ladybugs)

Heteroptera (bugs)

Chrysopidae (green lacewings)

Syrphidae (hoverflies)

(Wezel et al. 2014, publication for FAO)

Agroforestry

Walnut wheat agroforestry system, SE France

Grape vine-olive trees-walnut trees agroforestry system, central Italy

Walnut-lucerne agroforestry system, central Italy

(Wezel et al. 2014, publication for FAO)

Agroforestery

(Wezel et al. 2014, publication for FAO)

Livestock management

Autonomy for fodder, management of livestock densities, management of manure, living condition of livestock

(Wezel et al. 2014, publication for FAO)

Miguel Altieri 2005

Miguel Altieri 2005

Miguel Altieri 2005

Similar practices in EU, IFOAM and Agroecology

- Soil tillage (minimum tillage)
- Soil fertility and fertilisation (practices)
- Crop and cultivar choice: locally adapted
- Crop rotations: leguminous, cover crops, green manure crops to have diversified rotations
- Pest, disease and weed management (practices)

Differences in practices in EU, IFOAM and Agroecology

- Soil fertility and fertilisation (products and amount)
- Intercropping
- Management of landscape elements
- Pest, disease and weed management (products)
- Water quantity and quality management
- Agroforestry

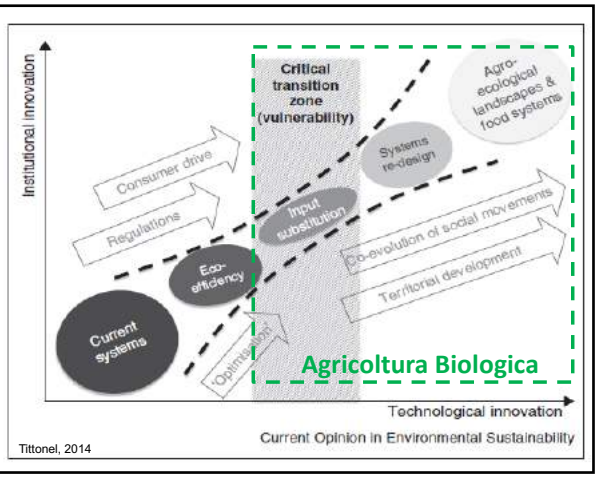
Only EU	Only IFOAM	Only Agroecoogy
• organic material in in cooperation with other organic farms in the region • maximum 170 kg N/ha/year • annex with list allowed external products for fertilisation • cultivar choice: only organic certified seeds and no GMO • habitat development as the precautionary measures to be taken in order to reduce the risk of contamination • annex with list of allowed products for pests and diseases • water: limiting amount of livestock units and nitrogen inputs per hectare	• organic material from the farm or from local origin; • annex with list allowed external products for fertilisation • not allowed to burn vegetation • cultivar choice: organic seed and no GMO • maintaining or establishing landscape elements or ecological infrastructure • annex with list of allowed external products for pests and diseases • crop protection: on-farm preparations • preserve water quality and monitor water extraction enhancing the practices of recycle rainwater	• no tillage with direct seeding; superficial tillage • fertilisation (organic and chemical) • split fertilisation, biofertiliser • intercropping, relay intercropping • pesticides derived from plants or plant extracts • maintaining or establishing landscape elements or ecological infrastructure • drip irrigation (and cover crops and intercropping to reduce nutrient leaching) • agroforestry: intercropping with crops and rows of woody vegetation; fruit tree meadows/pastures

Fig. 3. Conformity and differences in EU organic, IFOAM and Agroecology crop production practices

Sources: Migliorini and Wezel (2017)

IFOAM 2016

IFOAM 2016



Organic 1.0 >> 2.0 >> 3.0

Organic 3.0 is the next challenge for the SOAAN Think Tank

3.0 The future

SOAAN, the process of describing the revolution

2.0 Todays well-codified Organic World with 65 bil $ consumer purchases

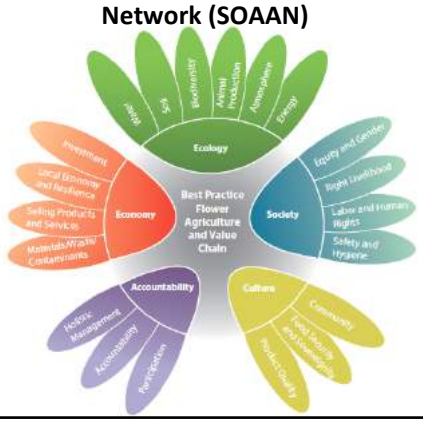
1.0 The World of the Organic Pioneers

IFOAM 2016

Features of a new organic agriculture

- Family or community based
- strong linkages between consumers and farmers
- biologically and culturally diverse
- small-medium scale
- humane and compatible with wild biodiversity
- local production

IFOAM Sustainable Organic Agriculture Action Network (SOAAN)



1st circular

First Agroecology Europe Forum

Fostering synergies between movements, science and practice

25-27 October 2017, Lyon, France

Agroecology Europe (www.agroecology-europe.org) is an association which aims to promote agroecology in the farming and food sector and in wider society. To move forward agroecology, the association will, in association with other NGOs, organise the first Agroecology Europe Forum, to take place 25-27 October at ISARA, in Lyon (France).

The **Forum** is open to all kinds of actors and intends to foster interactions between various stakeholders such as scientists, practitioners, social movements, civil society and policy makers, by facilitating knowledge sharing and common action. It aims at the creation of an inclusive European community of professionals, practitioners, and more generally societal stakeholders interested in agroecology.

Duration and Location
2.5 days (0.5 day on Friday afternoon for farm visits). Location: ISARA, Lyon (France).

Contact
Alain Peeters (Secretary Agroecology Europe): alain.peeters@agroecology-europe.org
Alexander Wezel (Vice president Agroecology Europe and local organiser): awezel@isara.fr

Thank you!