agritech
National Research Center for Technology in Agriculture

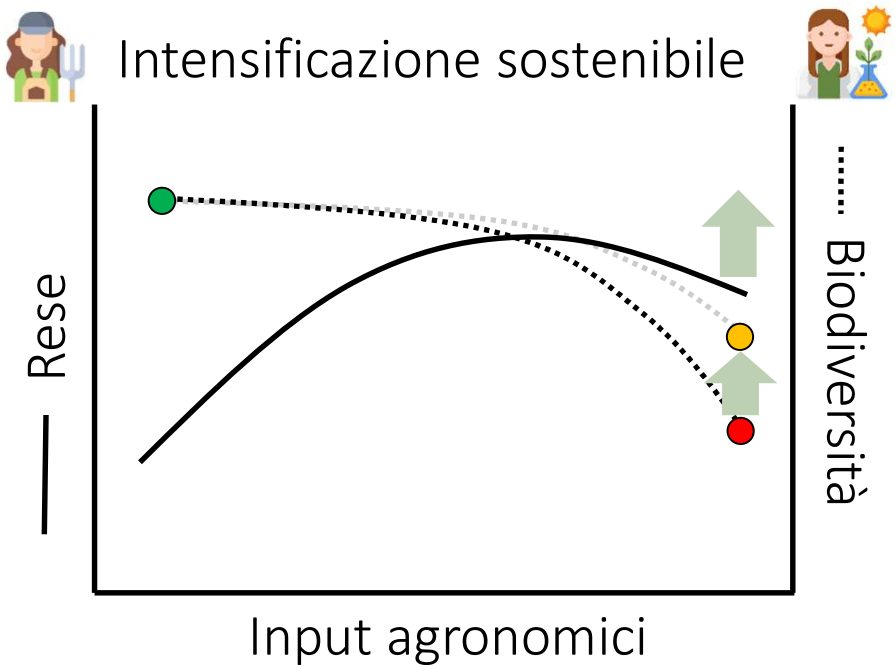
UNIVERSITY OF PADOVA
DAFNAE
Department of Agronomy Food Natural resources Animals and Environment

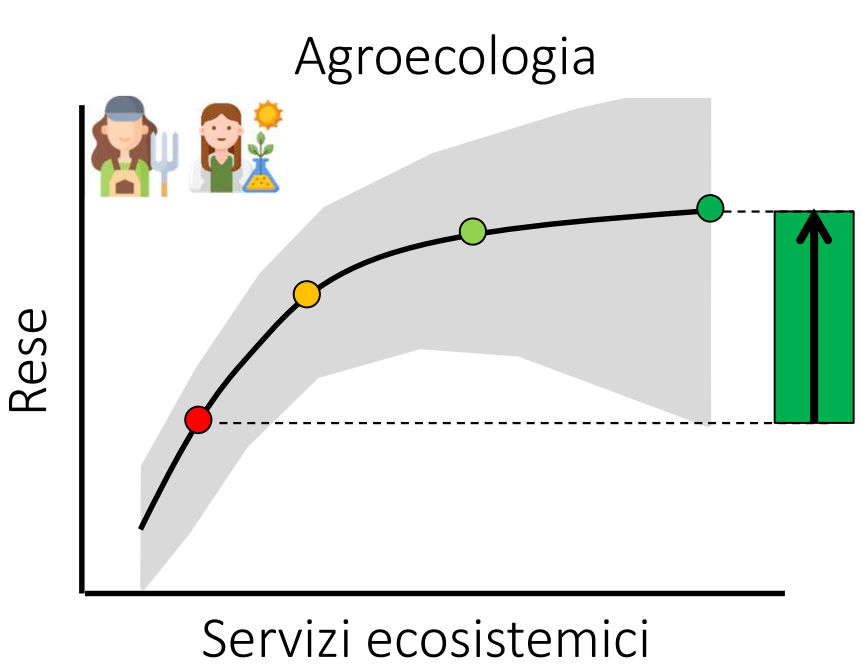
Sfide e opportunità per l'agroecologia

Lorenzo Marini, Università di Padova

Convegno finale REINFORCe
Verona, 20-21 Novembre 2025

I due paradigmi produttivi

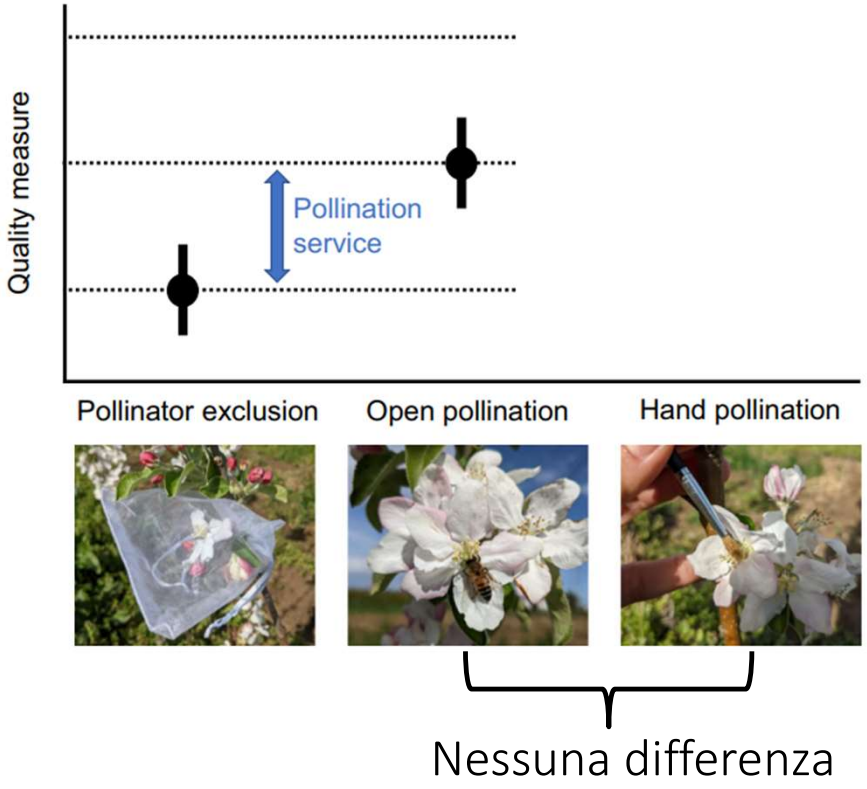




Impollinazione e qualità delle colture

Proprietà organolettiche
+ 24%

Proprietà nutrizionali
+ 5%



Nessuna differenza

nature communications

Article

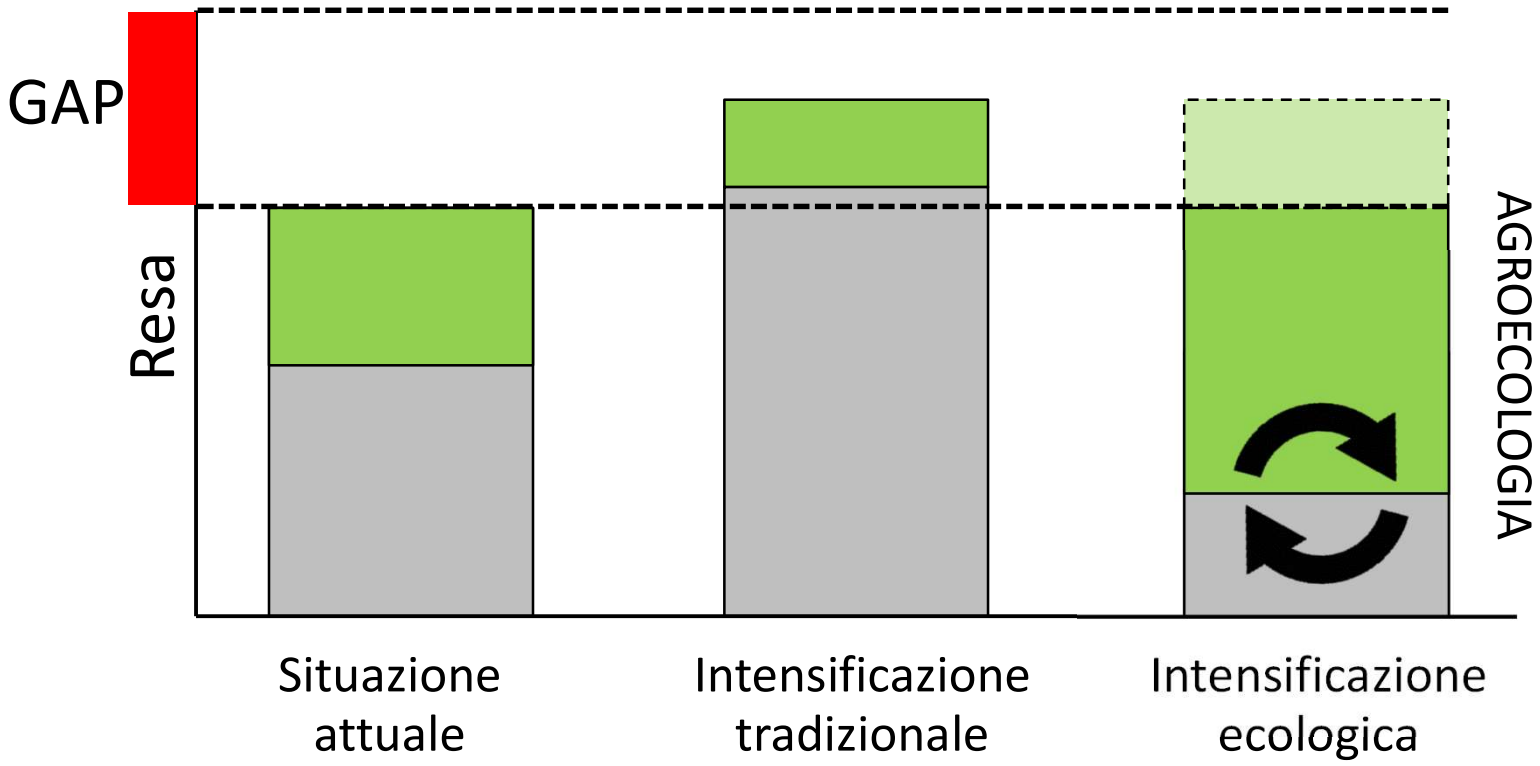
https://doi.org/10.1038/s41467-023-40231-y

Global meta-analysis shows reduced quality of food crops under inadequate animal pollination

Received: 17 December 2022

Accepted: 17 July 2023

Elena Gazzea[1], Péter Batáry[2] & Lorenzo Marini[1]



Servizi ecosistemici (fertilità dei suoli, impollinazione, controllo biologico...)

Input (fertilizzanti, difesa chimica, irrigazione...)

Possiamo ridurre l’agrochimica con i servizi ecosistemici?

Biocontrollo/Paesaggio

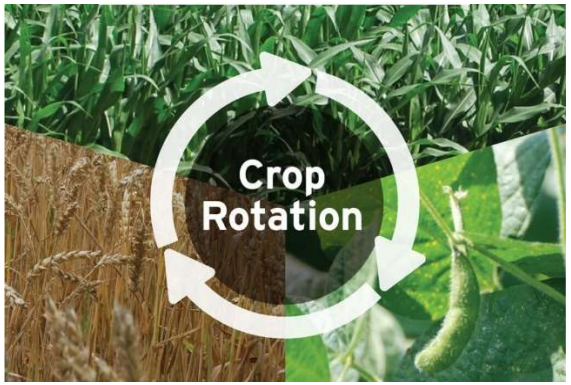
Fitofarmaci

Impollinazione

Fertilizzanti

Servizi del suolo

Fertilizzanti



Come favorire i servizi ecosistemici?

IN CAMPO

Pratiche agricole a scala locale

PAESAGGIO

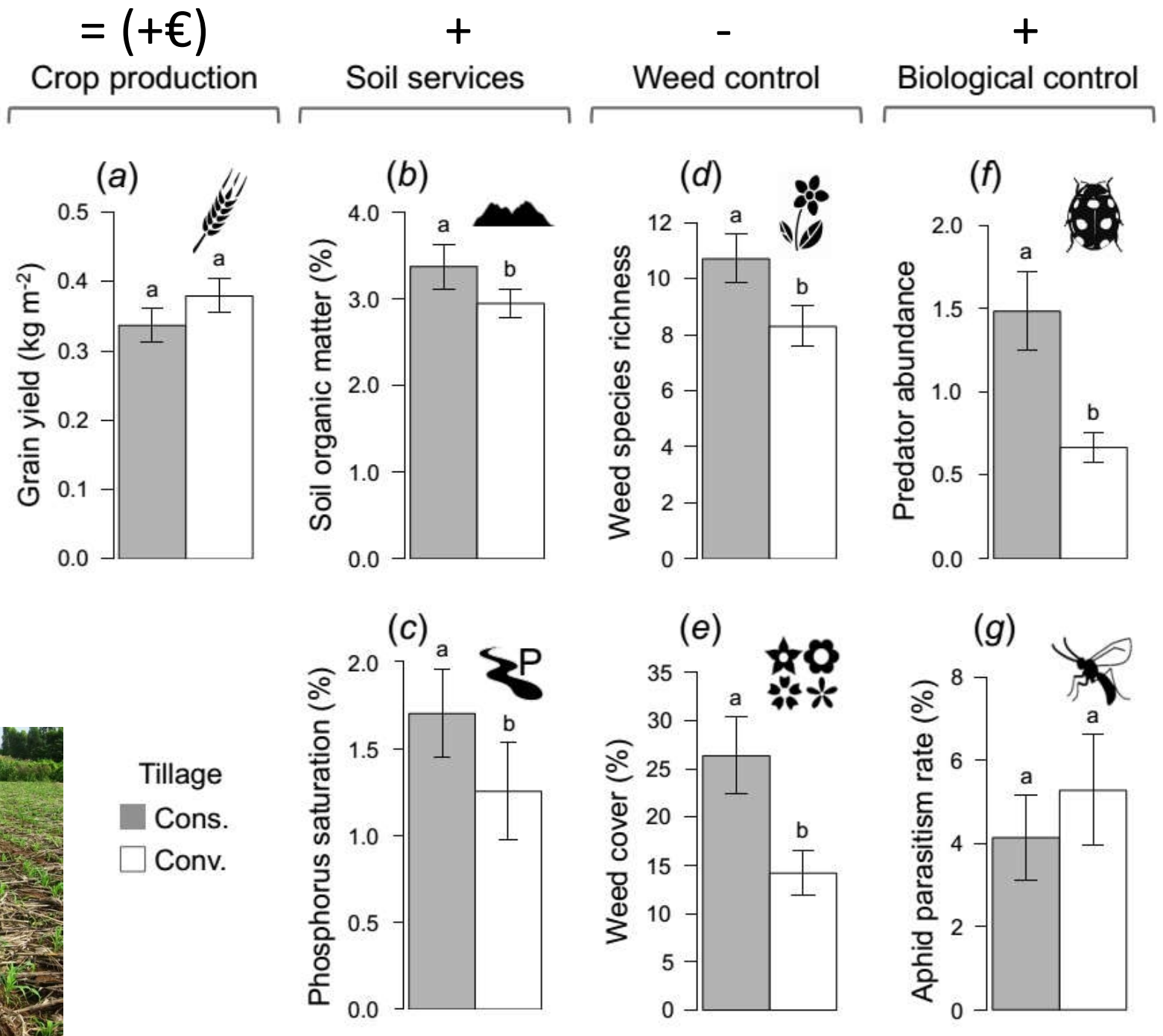
Ripristino degli habitat s-n
Diversità delle colture
Dimensioni degli appezzamenti…

Convenzionale vs. conservativa

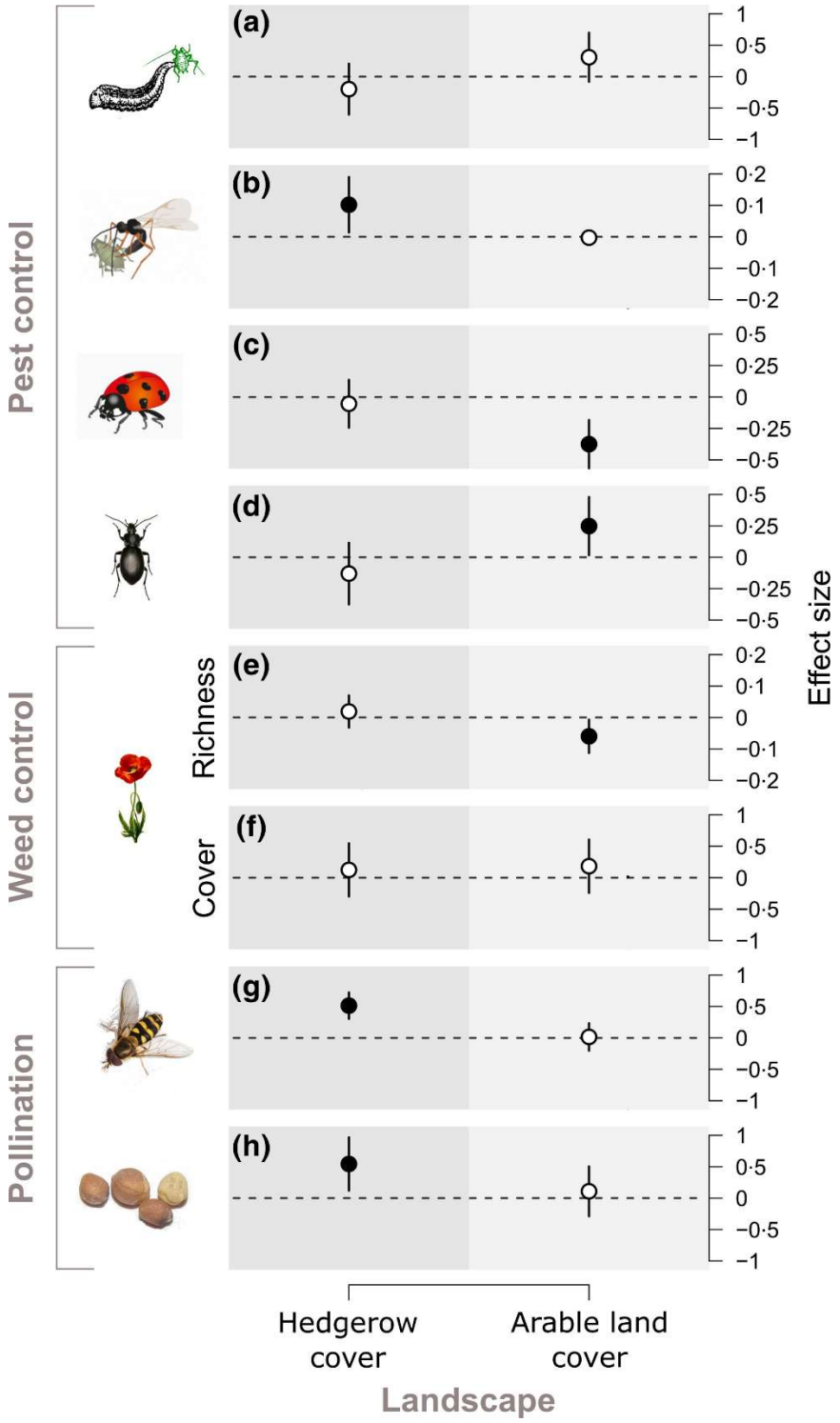
Controllo biologico e altri servizi

Gradiente di presenza di siepi (0-5%)

Convenzionale vs. conservativa



Siepi nel paesaggio e servizi



Possiamo generalizzare la risposta del controllo biologico al paesaggio?

PNAS LETTER | AGRICULTURAL SCIENCES

Testing the potential benefits of small fields for biocontrol needs a landscape perspective

Lorenzo Marini [a,1], Péter Batáry [b], and Teja Tscharntke [c]

December 27, 2022 | 120 (1) e2218447120 | https://doi.org/10.1073/pnas.2218447120

PROCEEDINGS B

royalsocietypublishing.org/journal/rspb

Research

Cite this article: Tamburini G *et al.* 2020 Species traits elucidate crop pest response to

Species traits elucidate crop pest response to landscape composition: a global analysis

Giovanni Tamburini[1,†], Giacomo Santoiemma[2,†], Megan E. O'Rourke[3], Riccardo Bommarco[4], Rebecca Chaplin-Kramer[5], Matteo Dainese[6], Daniel S. Karp[7], Tania N. Kim[8], Emily A. Martin[9], Matt Peterse… and Lorenzo Marini[2]

SCIENCE ADVANCES | RESEARCH ARTICLE

AGRICULTURE

A global synthesis reveals … -mediated benefits for crop produ…

Matteo Dainese[1,2*], Emily A. Mart…, …, Matthias Albrecht[4], Ignasi Bartomeus[5], Riccardo Bommarco[6], Luisa G… …cca Chaplin-Kramer[9], Vesna Gagic[10], Lucas A. Garibaldi[11], Jabo… …er Grab[13], Mattias Jonsson[6], Daniel S. Karp[14], Christina M. Kennedy[15] …e Kremen[17], Douglas A. Landis[18],

PNAS RESEARCH ARTICLE | AGRICULTURAL … OPEN ACCESS

Increasing crop field size … …sistently exacerbate insect pest …

Jay A. Rosenheim [a,1], Emm… …ey[a], Bodil N. Cass[a], Daniel Paredes [b], Soroush Parsa[c], Daniel S. Karp … …plin-Kramer [e,f,g]

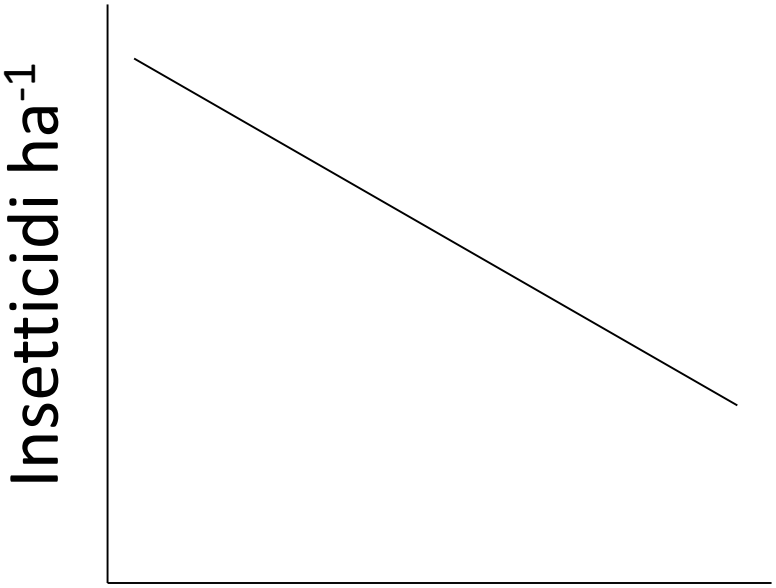
SEE COMMENTARY

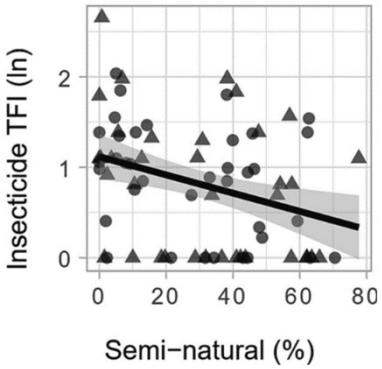
… …nd predators exhibit inconsistent … …s to surrounding landscape composition

…p[a,1], Rebecca Chaplin-Kramer[b], Timothy D. Meehan[c], Emily A. Martin[d], Fabrice DeClerck[e], Heather Grab[f], …ratton[g], Lauren Hunt[h], Ashley E. Larsen[i], Alejandra Martínez-Salinas[j], Megan E. O'Rourke[k], Adrien Rusch[l], …oveda[f], Mattias Jonsson[m], Jay A. Rosenheim[n], Nancy A. Schellhorn[o], Teja Tscharntke[p], Stephen D. Wratten[q], …ei Zhang[r], Aaron L. Iverson[f], Lynn S. Adler[s], Matthias Albrecht[t], Audrey Alignier[u], Gina M. Angelella[k], Muhammad Zubair Anjum[v], Jacques Avelino[w], Péter Batáry[p], Johannes M. Baveco[x], Felix J. J. A. Bianchi[y], Klaus Birkhofer[z], Eric W. Bohnenblust[aa], Riccardo Bommarco[m], Michael J. Brewer[bb], Berta Caballero-López[cc], Yves Carrière[dd], Luísa G. Carvalheiro[ee], Luis Cayuela[ff], Mary Centrella[f], Aleksandar Ćetković[gg], Dominic Charles Henri[hh], Ariane Chabert[ii], Alejandro C. Costamagna[ii], Aldo De la Mora[kk], Joop de Kraker[ll], Nicolas Desneux[mm], Eva Diehl[nn], Tim Diekötter[oo], Carsten F. Dormann[pp], James O. Eckberg[qq], Martin H. Entling[rr], Daniela Fiedler[ss], Pierre Franck[tt], F. J. Frank van Veen[uu], Thomas Frank[vv], Vesna Gagic[o], Michael P. D. Garratt[ww], Awraris Getachew[xx], David J. Gonthier[yy], Peter B. Goodell[zz], Ignazio Graziosi[aaa], Russell L. Groves[g], Geoff M. Gurr[bbb], Zachary Hajian-Forooshani[ccc], George E. Heimpel[ddd], John D. Herrmann[oo], Anders S. Huseth[eee], Diego J. Inclán[fff], Adam J. Ingrao[999], Phirun Iv[hhh], Katja Jacot[t], Gregg A. Johnson[qq], Laura Jones[o], Marina Kaiser[gg], Joe M. Kaser[ddd], Tamar Keasar[iii], Tania N. Kim[iii], Miriam Kishinevsky[kkk], Douglas A. Landis[999], Blas Lavandero[lll], Claire Lavigne[tt], Anne Le Ralec[mmm], Debissa Lemessa[nnn], Deborah K. Letourneau[ooo], Heidi Liere[iii], Yanhui Lu[ppp], Yael Lubin[qqq], Tim Luttermoser[f], Bea Maas[rrr], Kevi Mace[sss], Filipe Madeira[ttt], Viktoria Mader[nn], Anne Marie Cortesero[uuu], Lorenzo Marini[vvv], Eliana Martinez[www], Holly M. Martinson[xxx], Philippe Menozzi[yyy], Matthew G. E. Mitchell[zzz], Tadashi Miyashita[aaaa], Gonzalo A. R. Molina[bbbb], Marco A. Molina-Montenegro[cccc], Matthew E. O'Neal[dddd], Itai Opatovsky[eeee], Sebaastian Ortiz-Martinez[lll], Michael Nash[ffff], Örjan Östman[9999], Annie Ouin[hhhh], Damie Pak[iiii], Daniel Paredes[iiii], Soroush Parsa[kkkk], Hazel Parry[o], Ricardo Perez-Alvarez[f], David J. Perović[bbb], Julie A. Peterson[ddd], Sandrine Petit[lll], Stacy M. Philpott[ooo], Manuel Plantegenest[mmm], Milan Plećaš[99], Therese Pluess[mmmm], Xavier Pons[ttt], Simon G. Potts[ww], Richard F. Pywell[nnnn], David W. Ragsdale[oooo], Tatyana A. Rand[pppp], Lucie Raymond[mmm], Benoît Ricci[lll], Chris Sargent[h], Jean-Pierre Sarthou[qqqq], Julia Saulais[mmm], Jessica Schäckermann[rrr], Nick P. Schmidt[dddd], Gudrun Schneider[d], Christof Schüepp[mmmm], Frances S. Sivakoff[ssss], Henrik G. Smith[tttt], Kaitlin Stack Whitney[uuuu], Sonja Stutz[vvvv], Zsofia Szendrei[999], Mayura B. Takada[wwww], Hisatomo Taki[xxxx], Giovanni Tamburini[m], Linda J. Thomson[yyyy], Yann Tricault[zzzz], Noelline Tsafack[aaaaa], Matthias Tschumi[t], Muriel Valantin-Morison[bbbbb], Mai Van Trinh[ccccc], Wopke van der Werf[ddddd], Kerri T. Vierling[eeeee], Ben P. Werling[fffff], Jennifer B. Wickens[www], Victoria J. Wickens[ww], Ben A. Woodcock[nnnn], Kris Wyckhuys[99999,hhhhh], Haijun Xiao[iiii], Mika Yasuda[iiiii], Akira Yoshioka[kkkkk], and Yi Zou[lllll]

VARIABILITA' LEGATA AL CONTESTO

Paesaggio e uso di insetticidi





Italia

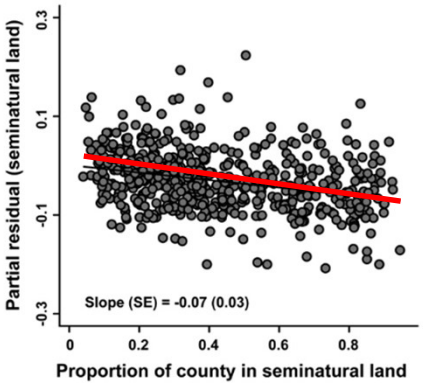
Ortis et al. (unpubl.)

Geppert et al. 2024

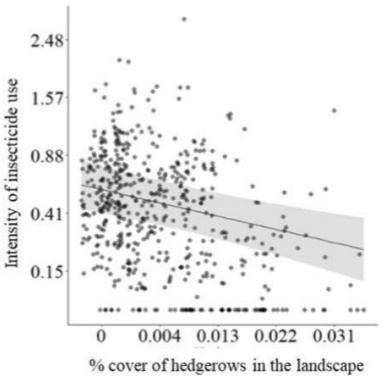
Courson et al. 2024

Larsen et al. 2017

Mehaan et al. 2011

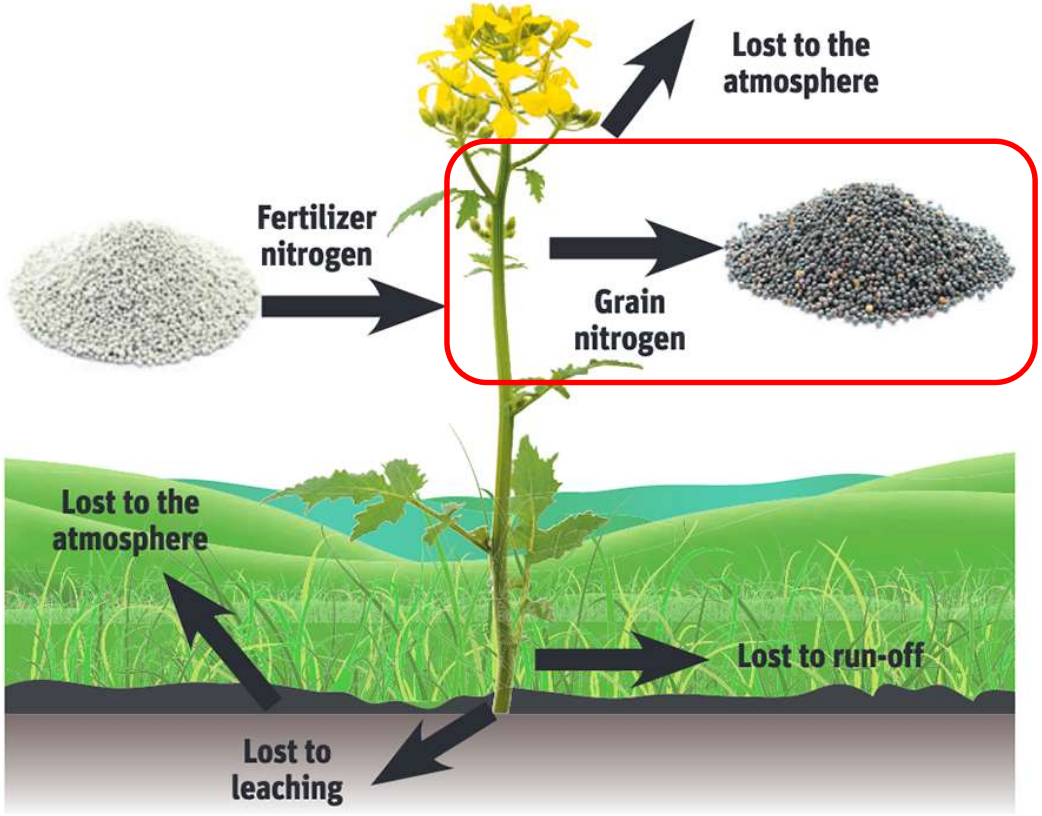


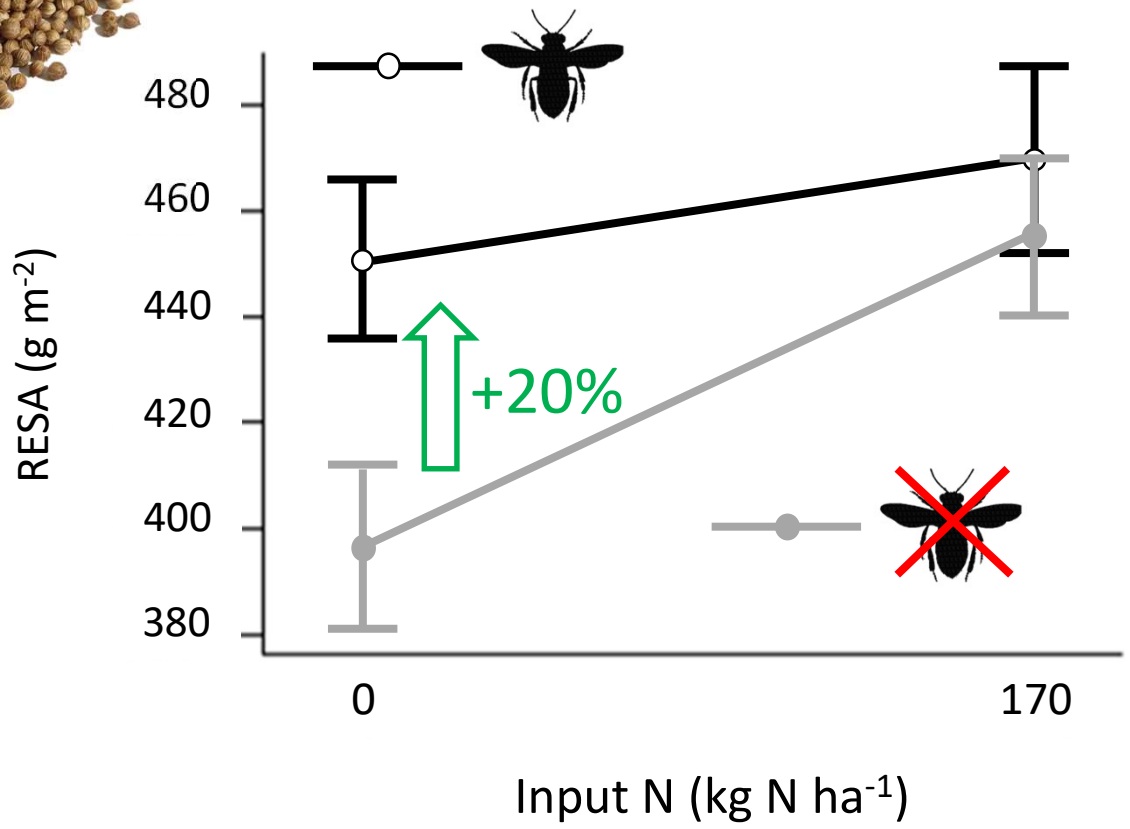
USA (pre OGM)



Francia

Possiamo migliorare l’efficienza nell’uso dei nutrienti attraverso la biodiversità funzionale?



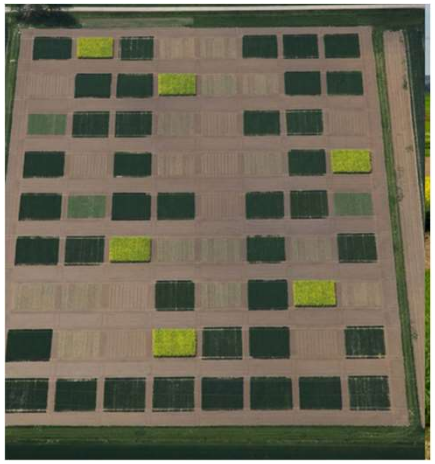


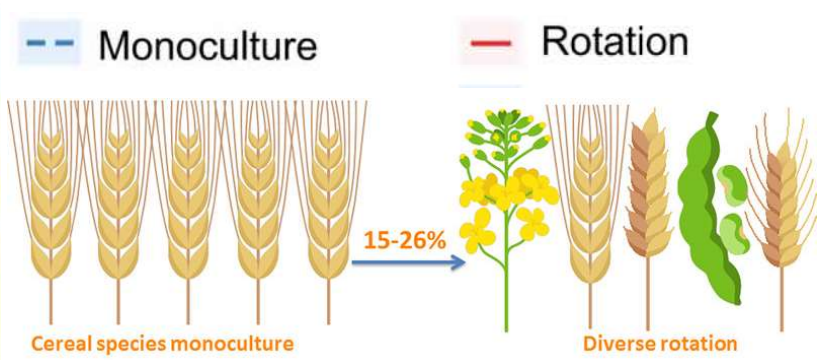
Marini et al. AGEE

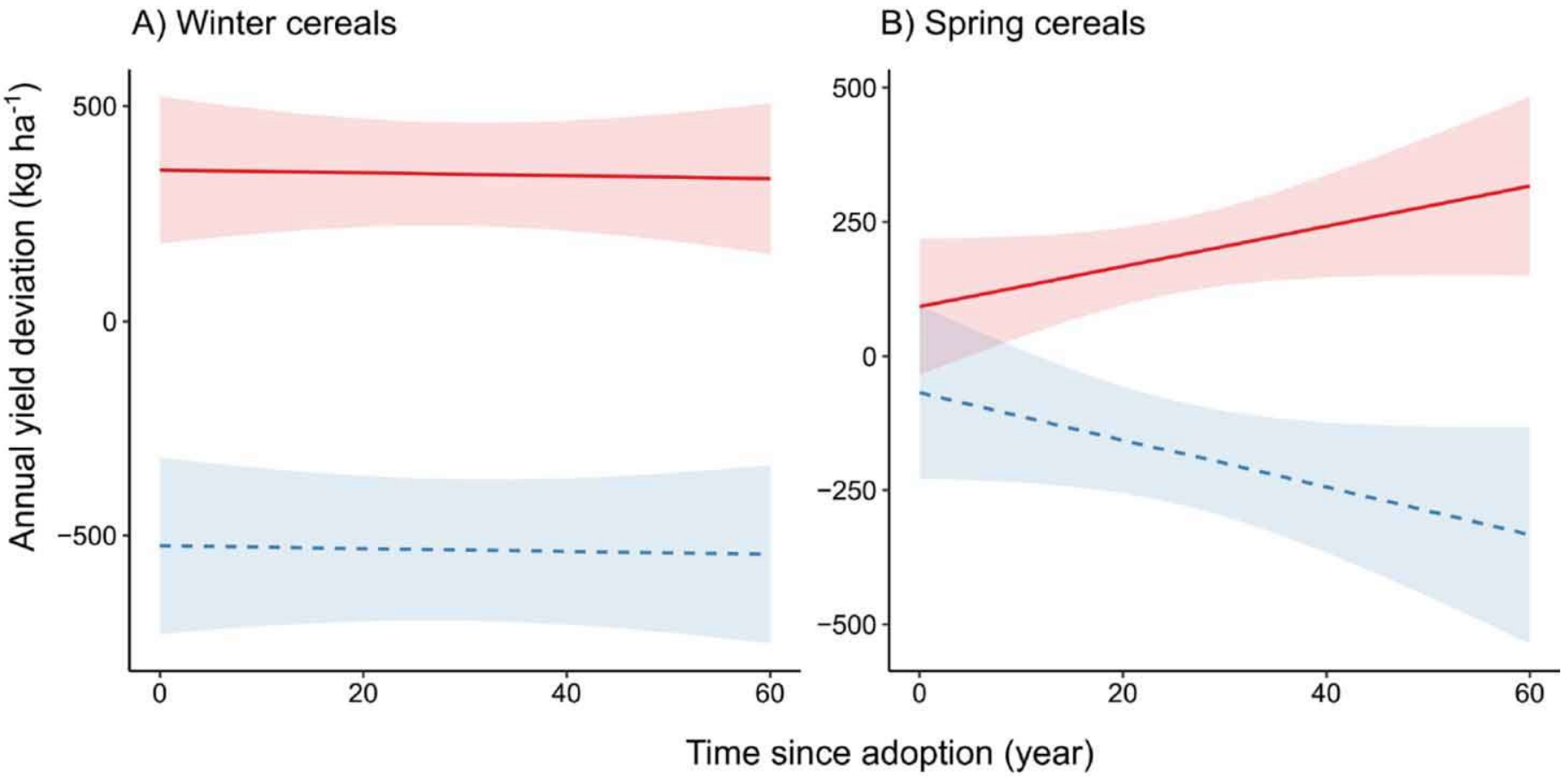
Marini et al. Env. Lett. 2021

RESE MEDIE=4-7 t ha^{-1}

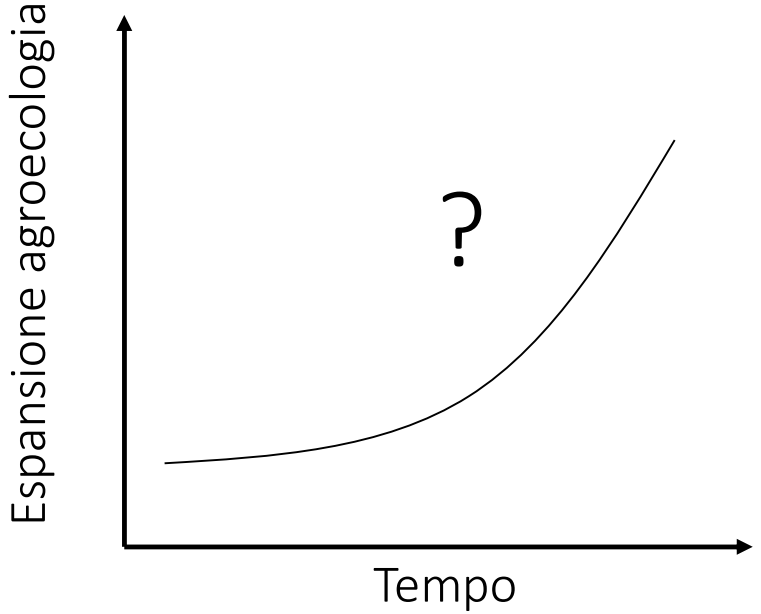
NPK dose raccomandata







Quali sono gli ostacoli all'espansione dell'agroecologia?



Sistemi alimentari globali e dipendenza dai mercati

Tre sfide per l'agricoltura europea:
1) Cambiamento climatico
2) Sostenibilità
3) Cambiamento della domanda (- carne)

POLITICHE EU

Riduzione agrochimica

AGROECOLOGIA

Rispristino degli habitat

Barriere a livello locale

Campo

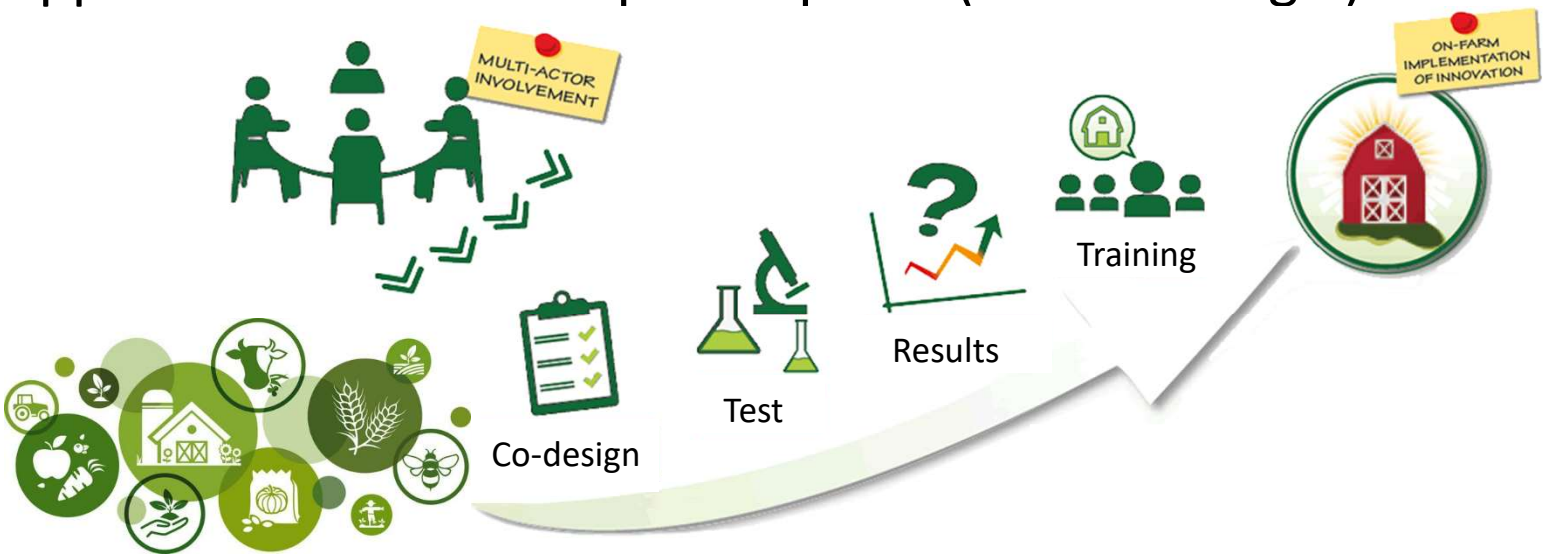


Paesaggio

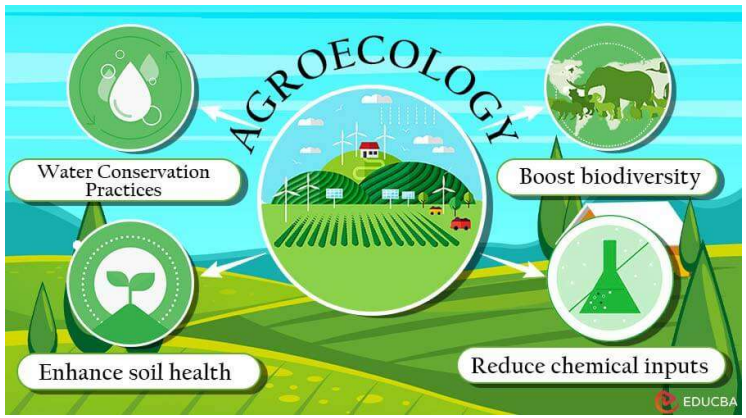


Sostenibilità economica?
Barriere culturali
Tecniche
Rigidità dei disciplinari
Maggiore complessità…

Approcci multi-attore e partecipativi (socio-ecologia)



Integrazione di diversi paradigmi produttivi: strategie multiple



Biotechnology and Crop Improvement

La ricerca sta sviluppando efficaci approcci a scala di pianta e campo

Pianta Campo Paesaggio

L’agroecologia ci può aiutare a comprendere come combinare queste strategie considerando la necessità di creare paesaggi agricoli multi-funzionali in cui produzione e altri servizi possano coesistere

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Grazie per l’attenzione