Improving & deploying biocontrol strategies: a multidisciplinary challenge

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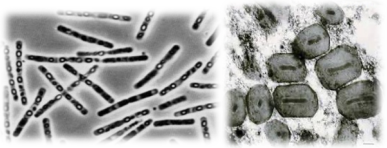
What is biocontrol?

Micro-organisms

Bacteria, fungi, virus



Macro-organisms

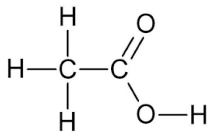
Insects, mites, nematodes

Biocontrol Plants

Direct regulation or via organisms

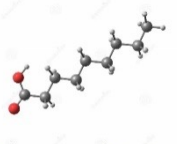
Semiochemicals

Pheromones, kairomones



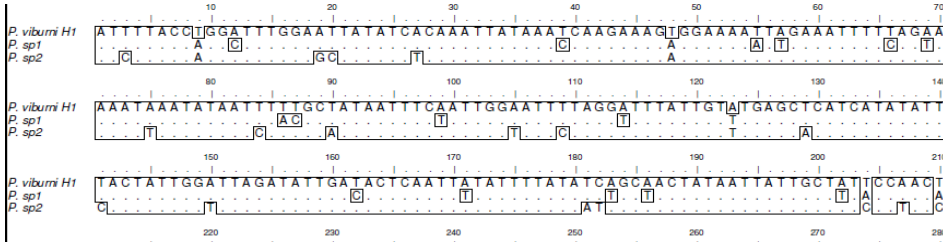
Natural substances

animal, vegetal, (mineral)



10 years on population biology of biocontrol agents

On the identification of target pests & biocontrol agents



→ *Not so simple! Many complexes of cryptic species & many mismatches*

On genetic & phenotypic factors explaining the success of biocontrol agents

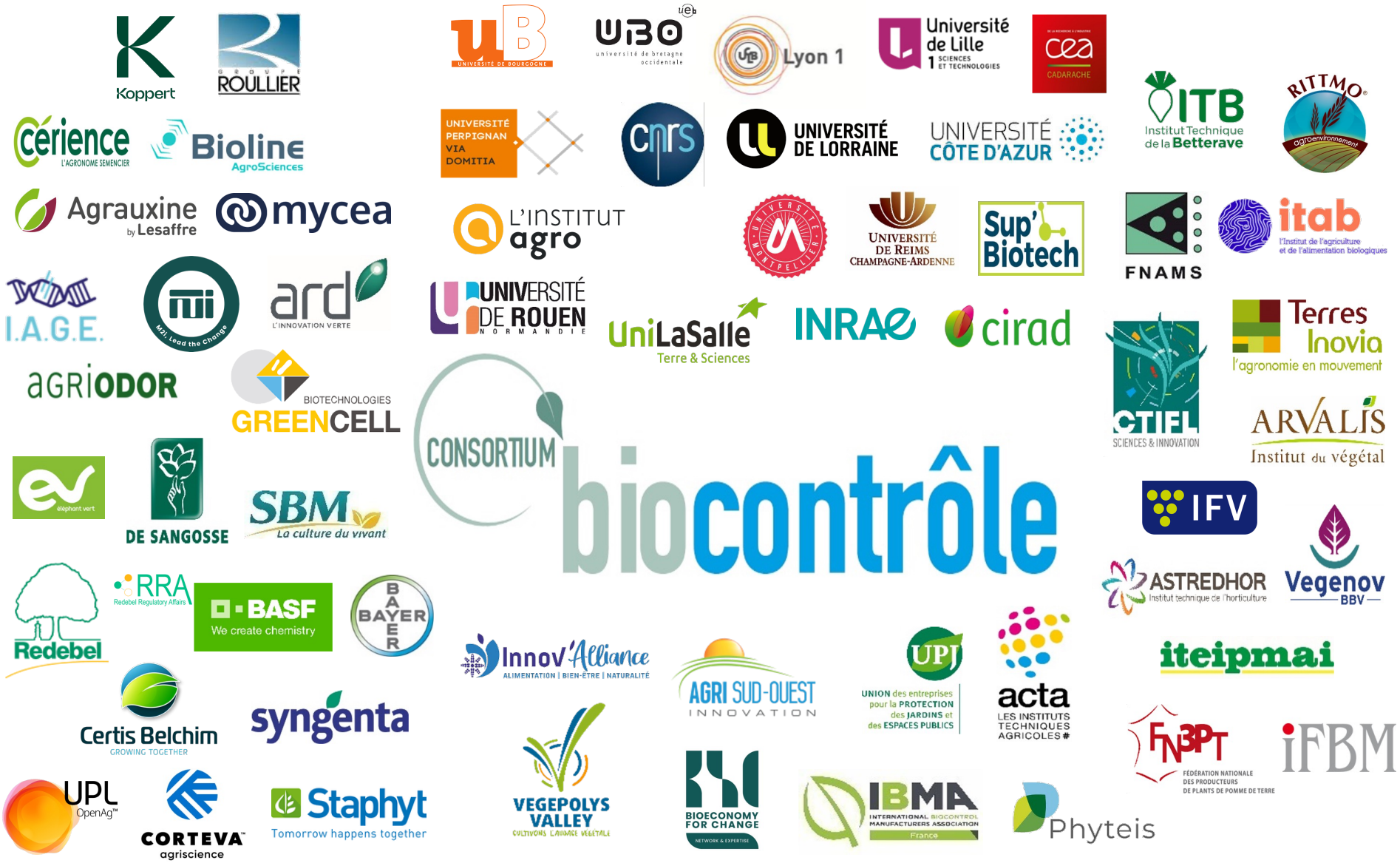
biobest SUSTAINABLE CROP MANAGEMENT

Bioline AgroSciences Xilema control biológico

→ *Yes, genetics matters! Inbreeding, genetic drift, heterosis, etc.*

→ *Biocontrol agents can be easily improved!*

Coordination of the FR public-private consortium on biocontrol (2016-)

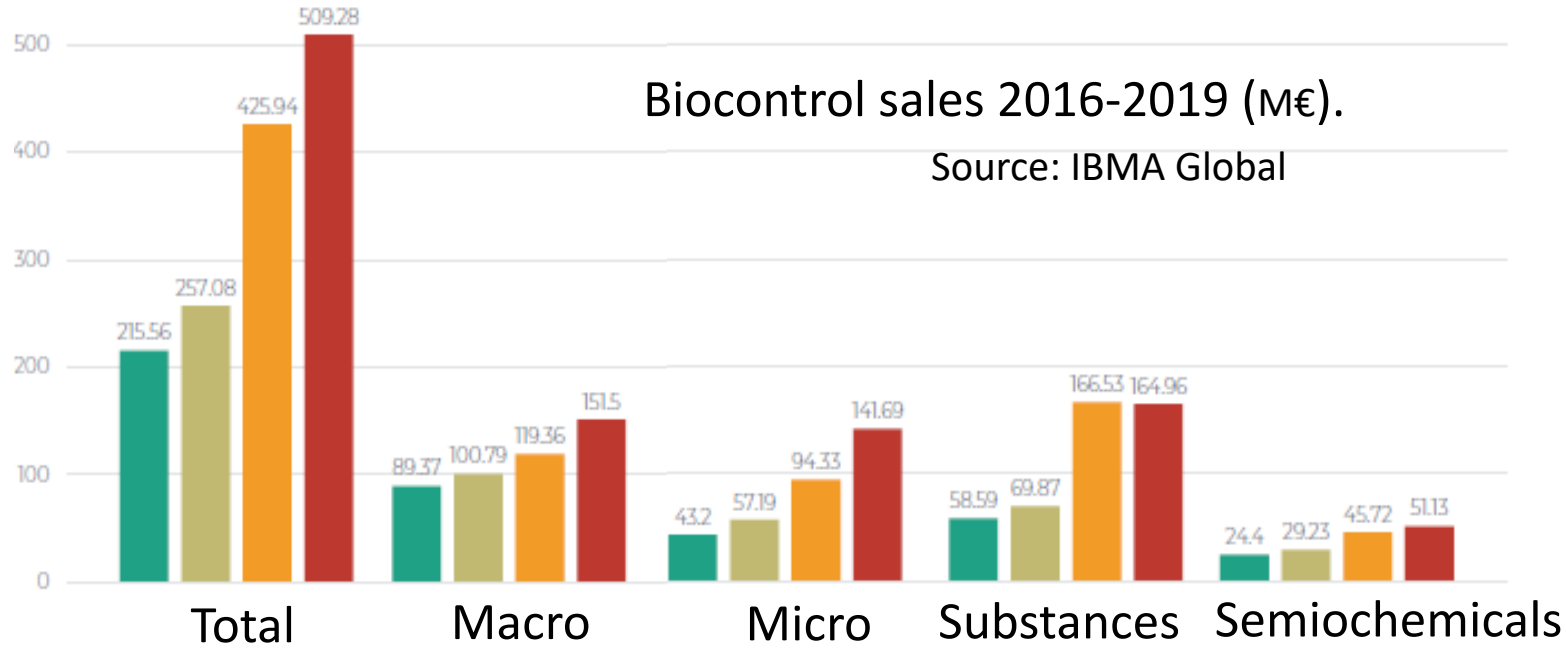


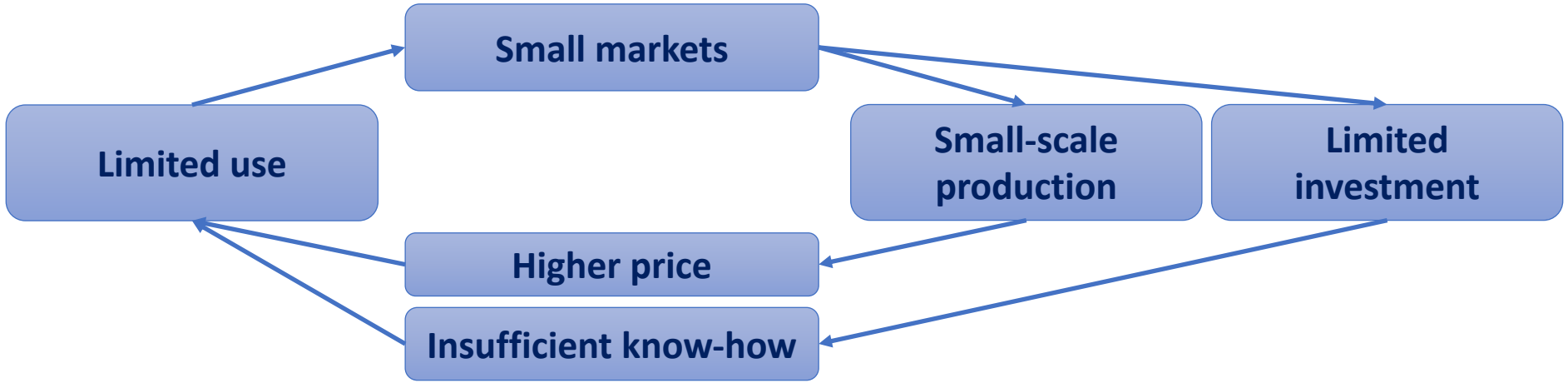
Biocontrol: sometimes successful, often in a locked situation

Widespread & successful in greenhouses

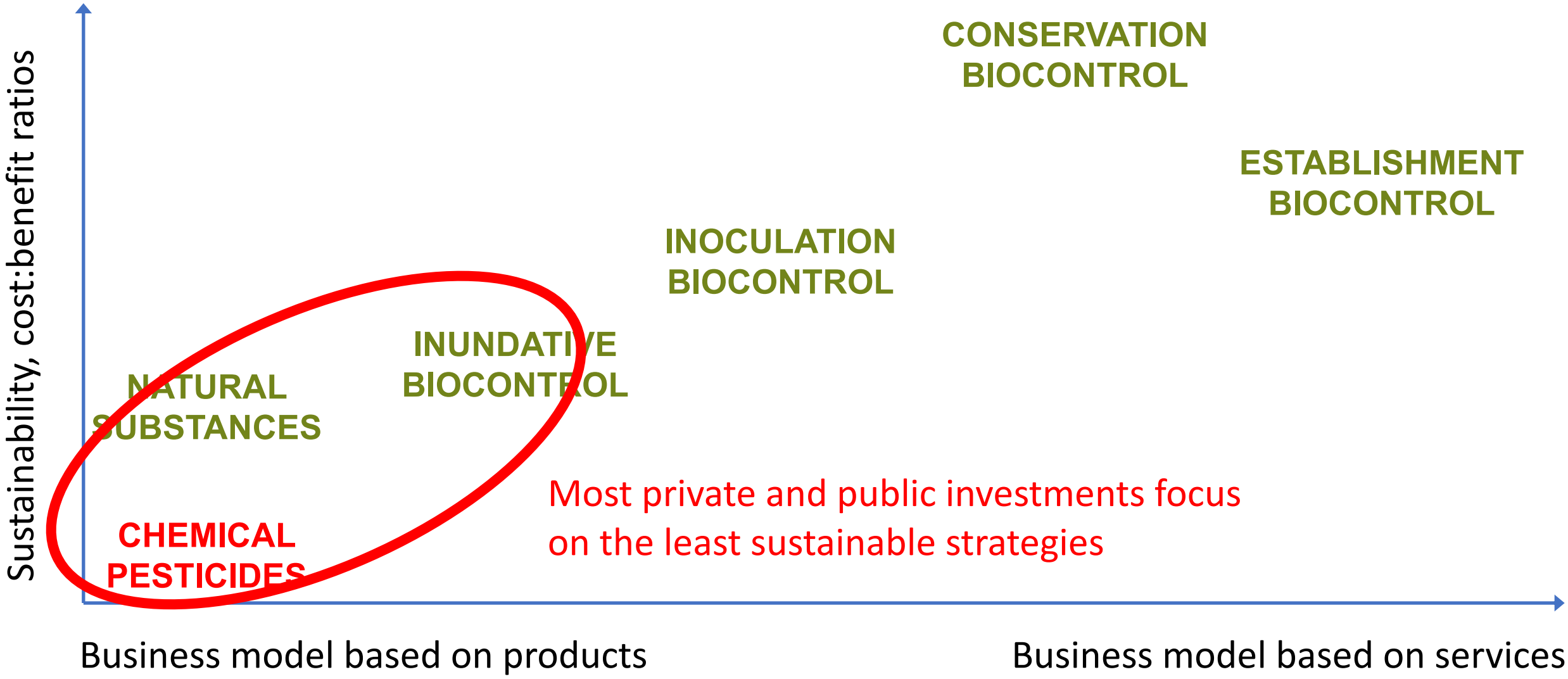
But…

< 10% of the EU crop protection market

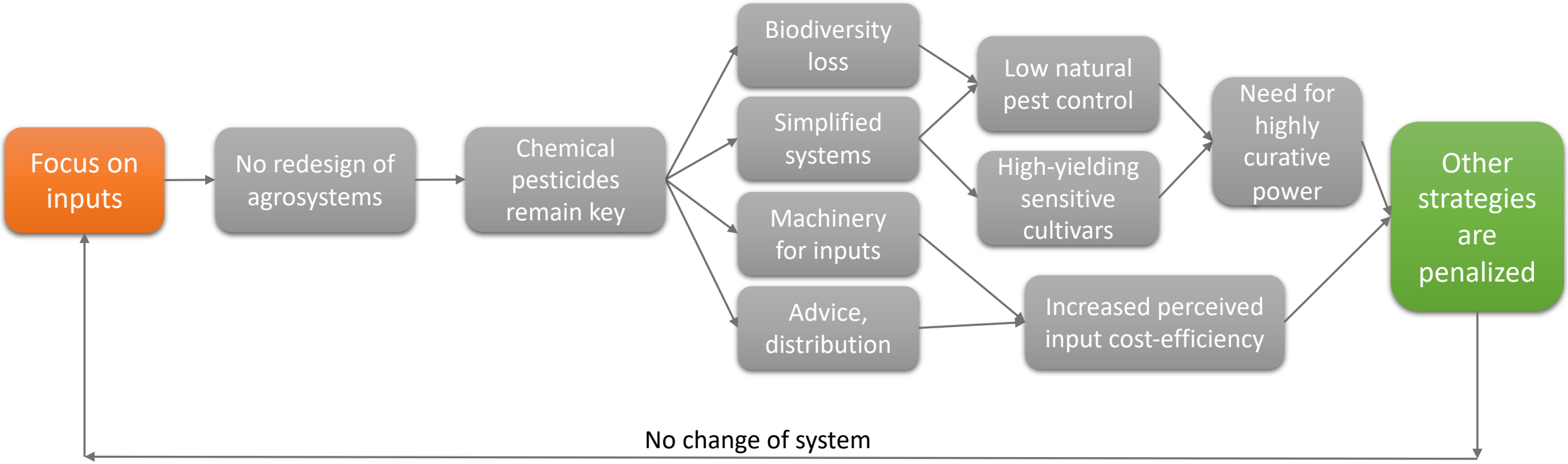




A matter of strategies & business models



Focusing on BC products complementary to chemical pesticides, for systems designed for pesticides, reinforces the locked situation



→ Need for diversified and sustainable biocontrol strategies in pesticide-free systems

Jacquet, F., M.-H. Jeuffroy, J. Jouan, E. Le Cadre-Barthélemy, I. Litrico, Malausa, T., Reboud, X., Huyghe, C. (2022). Pesticide-free agriculture as a new paradigm for research. Agronomy for Sustainable Development 42.

Thank you for your attention!