



Development of methods for evaluation of plant biostimulants

Plant Biologicals Network Symposium 2022

11/9/2022

 **Lantmännen**



Lantmännen BioAgri's core businesses

Biological seed treatment

Cedomon[®], Cerall[®], Cedress[®]
based on the inoculant
pseudomonas chlororaphis



Seed technology

ThermoSeed[®]
thermal seed treatment based
on steam pasteurisation.



Biostimulants

Retailer of biostimulants for the
Nordic region eg Stimplex[®] based on
ascophyllum nodosum



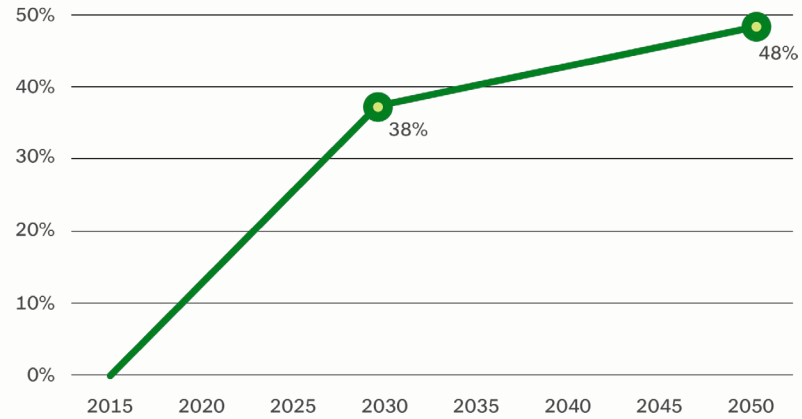
The Lantmännen Model

- Lantmännen is a farmers' cooperative and Northern Europe's **leading player** in agriculture, machinery, bioenergy and food.
- We are owned by 19 000 farmers, have 10 000 employees, operations in some 20 countries, and an annual turnover of SEK 55 billion.
- Lantmännen is a business partner of the farmers.
- Lantmännen conducts **research** and **innovation** for the food of the future and the bioenergy and farming of tomorrow.
- With farmland as our basis, Lantmännen creates **value throughout** the entire **value chain** from field to fork.



Potential for winter wheat

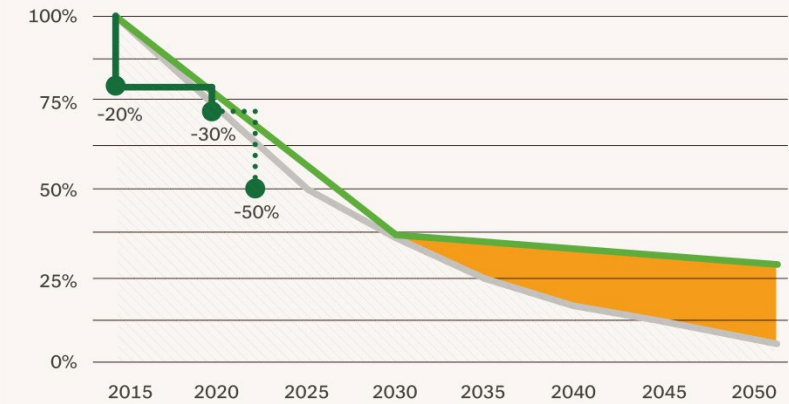
Skördeökning (%)



We can increase harvest...

...while reducing the climate impact

Climate impact CO₂e (%)

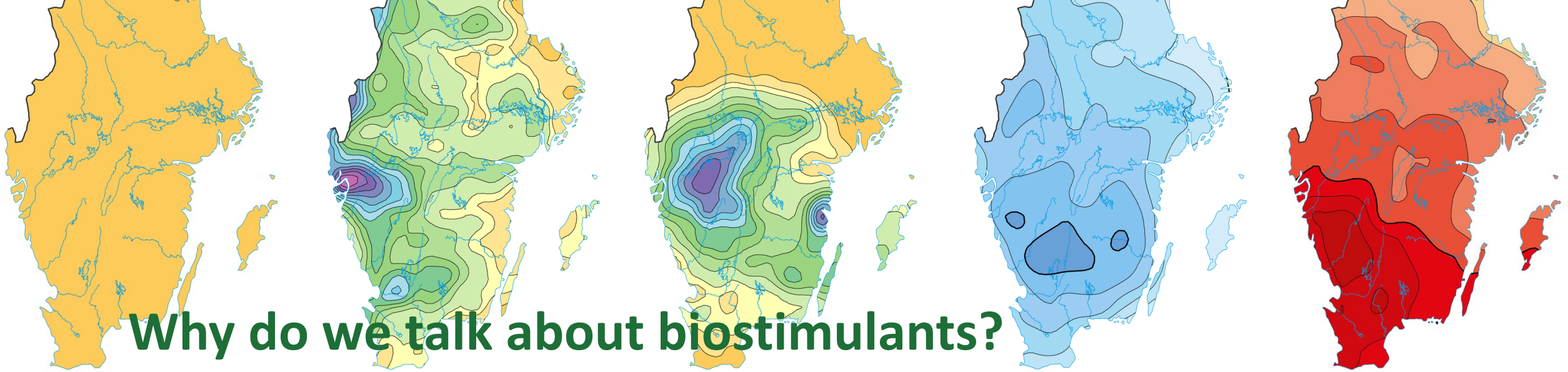


Reduced climate impact from cultivation of wheat within cultivation concept Climate & Nature CO₂e (%)

Potential for reduced CO₂e

Emissions reduction pace in order to reach the Paris Agreement

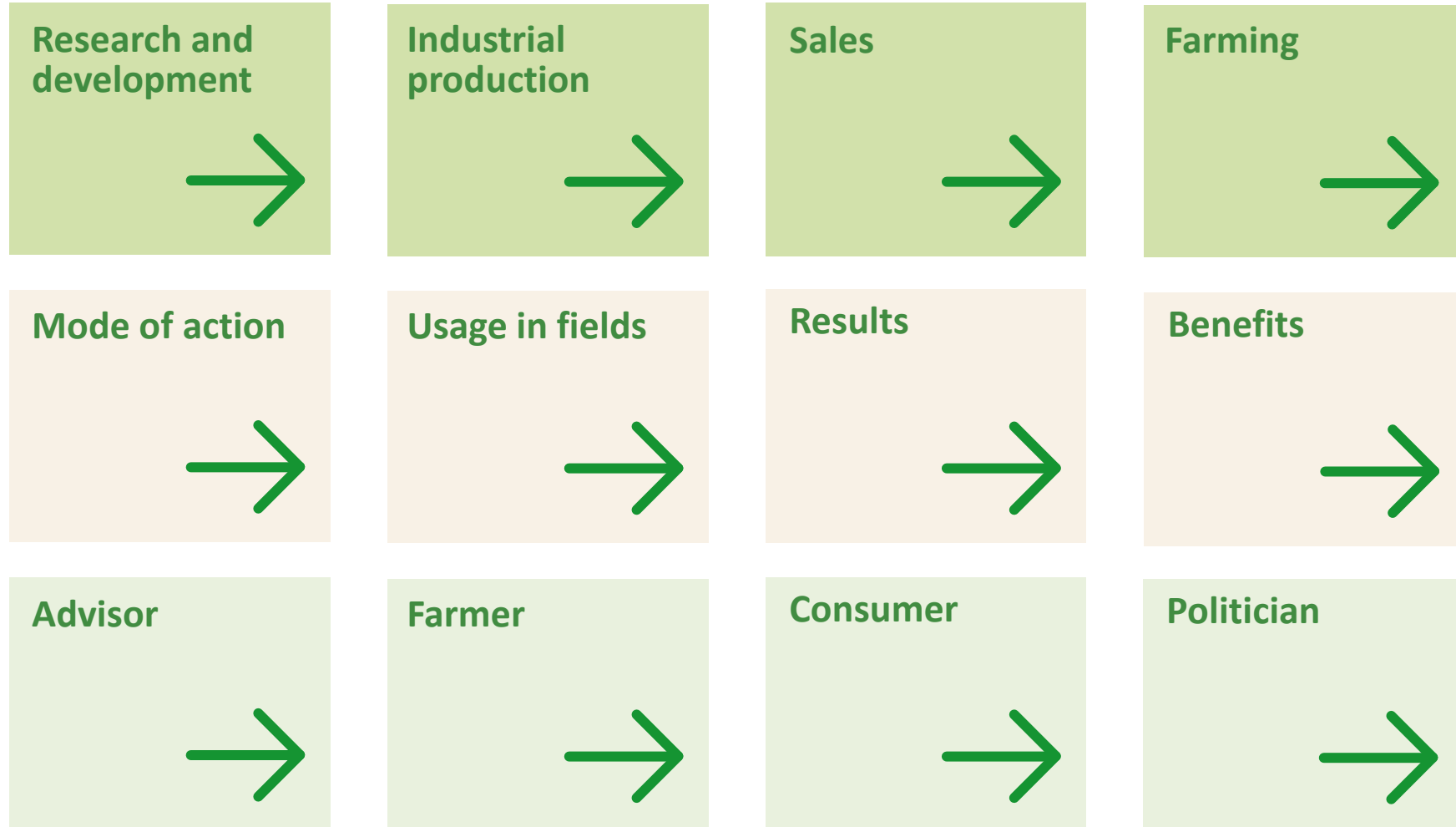
Innovation gap



- Biostimulants have been used in agriculture for hundreds of years – unaware of their potential.
- The potential of biostimulants is widely discussed but difficult to analyze and estimate
- Climate changes and other driving forces push us seeking for new solutions – time is running out.
- The market is flooded by biostimulants' promising miracles.
- Navigation in the jungle is urgently needed – no time to lose and high expectations to fulfill.
- Trust capital – hard to earn and easy to lose.



Close the knowledge gap



Research from a business perspective



To close that gap, we need appropriate methods and tools for testing and analyzing biostimulants – how to use and when to use



In January 2022, Lantmännen BioAgri and Agroplantarum launched the project **Development of methods for evaluation of plant biostimulants for future sustainable farming**, founded by Lantmännens Forskningsstiftelse.



The project's aim is to develop **cost-efficient** and **time-saving methods** for the evaluation of biostimulants in the Nordic region.



Agroplantarum AB



The roadmap





Bioassays

- Elucidation of the potential bioactivity of biostimulants.
- Root establishment and colonization of microbes.
- Purity of the biostimulants.
- ...

Controlled environment

- Climate chamber, mimicking different growing conditions.
- Greenhouse, provoking different kinds of stress.
- ...

Field trials

- Semi-field experiments.
- Field plot trials.
- Large-scale field trials and demo cultivations.
- ...

Results so far

- **Heterogenic group** of biostimulants with different modes of action.
- **Measured classification** of biostimulants helps to sort out methods and tools for evaluation.
- **Modify** and **develop field trials** in order to match the biostimulant's mode of action and needs.
- Establish **transparency** and **collaboration** throughout the whole value chain from the early beginning.
- **Communication** and **knowledge exchange** are fundamental for successful testing and market penetration.



Changes start in someone's head,
but they become reality
in the farmers' fields