

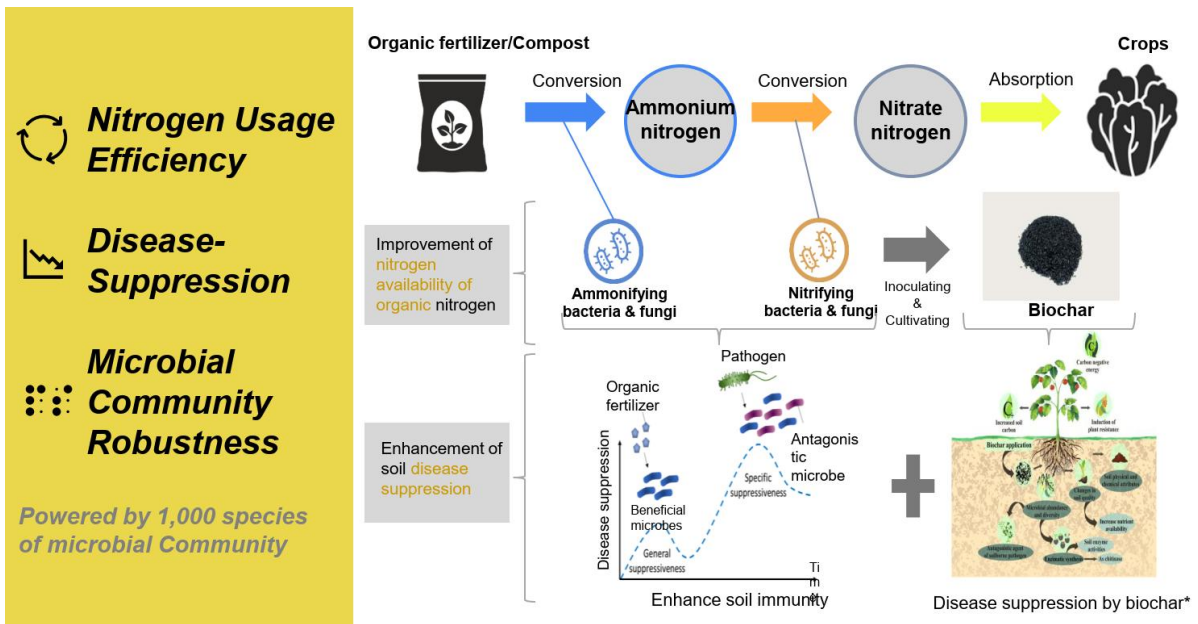
Appendix: Innovative Japanese Technologies and Approaches Contributing to Regenerative  
Agriculture and Sustainable Agricultural Soil Conservation

The List of technologies offered by the organisations that participated in the workshop

1	TOWING CO., Ltd.	Microbe-enhanced biochar for carbon sequestration and soil health	2
2	Sagri Co., Ltd.	Satellite and AI-driven soil monitoring platform for agricultural carbon accounting	4
3	AJINOMOTO Co., INC.	AminoScience®-based biostimulants that enhance plant stress tolerance and water-holding capacity	6
4	International Platform for Dryland Research and Education (IPDRE), Tottori University	Integrated sustainable land management practices, comprising 13 technologies and 4 approaches (e.g., alternative land-use scenario mapping, soil microbial inoculation, etc.)	8
5	Japan International Research Center for Agricultural Sciences (JIRCAS)	Cut-Soiler and Fallow Band System designed to combat soil salinization and wind erosion	10



## How SORATAN Works

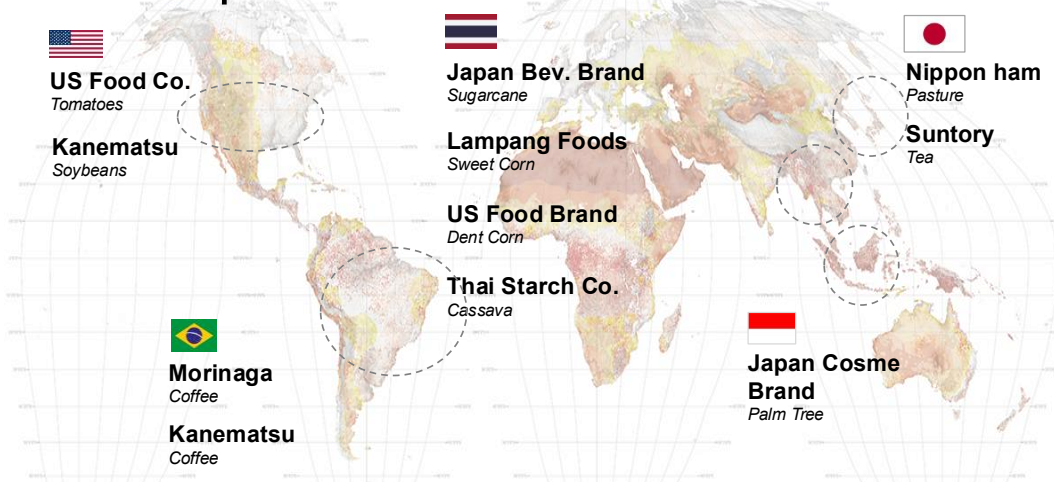


## Promising Regions and Fields for Future Expansion

- Promising Regions: Geographically, the most promising regions are the United States, Brazil, and Southeast Asian countries like Thailand and Indonesia. These areas possess abundant agricultural biomass and face severe soil degradation and decarbonization pressures.
- Promising Fields: Forming partnerships with global Consumer Packaged Goods (CPG) companies is highly viable. SORATAN can be integrated into their supply chains for industrial crops like sugarcane, coffee, and corn to achieve Scope 3 decarbonization targets through carbon insetting and regenerative agriculture.

## Partners across the Globe

## Partnering with various FMCG companies for various crops across the world



## 2. Sagri Co., Ltd.

### Overview and Features of the Technology

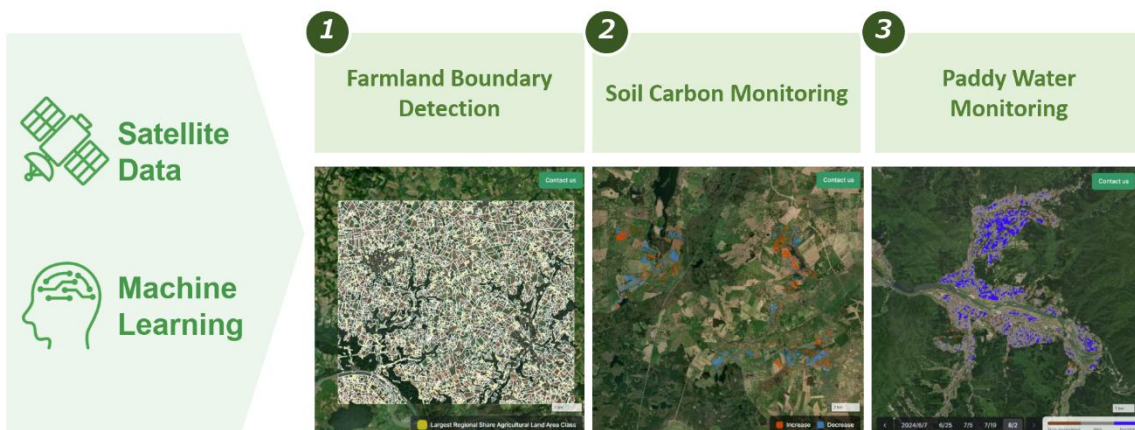
- Sagri, a spin-off startup from Gifu University, has developed a satellite-based analytical technology that detects trends in soil organic carbon (SOC) across large agricultural landscapes. By integrating multi-temporal satellite imagery, machine learning models, and statistical analysis, the system identifies farmland where soil carbon levels are increasing or decreasing over time.
- Traditionally, identifying effective regenerative agriculture practices requires multi-year field trials and costly soil sampling campaigns. Sagri's technology significantly accelerates this process by analysing historical satellite data and agronomic information to detect correlations between farming practices and SOC changes.
- This approach enables large-scale, data-driven evaluation of sustainable agricultural practices without the need for extensive ground surveys.

### About Sagri



*Sagri is a Japan-based AgriTech startup providing satellite-powered soil, water, and farm monitoring solutions that drive sustainable agriculture through data and AI*

Our mission: **Creating Value by Visualizing Farmland**



### Effects and Strengths in Problem Solving

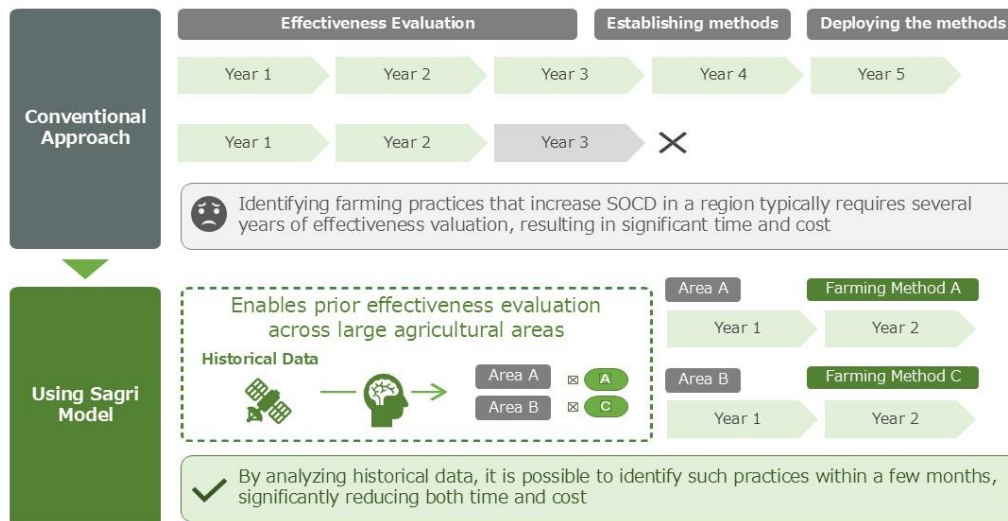
- Sagri's technology addresses a key challenge in regenerative agriculture and carbon farming: the long time and high cost required to evaluate the effectiveness of different agricultural practices.
- By leveraging satellite-based SOC trend detection, Sagri enables:
  - Rapid identification of effective farming practices that increase soil carbon levels
  - Significant reduction in evaluation time, from several years to a few months
  - Lower monitoring costs compared to conventional soil sampling approaches
  - Scalable monitoring across large agricultural regions

- This capability helps accelerate the adoption of regenerative agriculture practices by providing clear, evidence-based insights to farmers, agribusinesses, and policymakers.
- The technology can support carbon credit projects by enabling low-cost monitoring and verification of soil carbon changes. It also helps identify areas where soil carbon loss is occurring, allowing targeted interventions to restore soil health and agricultural productivity.



## Benefit of our technology

Sagri's model can identify the best practice for sustainable agriculture for regional scale



## Promising Regions and Fields for Future Expansion

- The technology has strong potential for deployment in regions where large-scale agriculture and decarbonization initiatives are expanding.
- Promising geographic regions include:
  - North and South America, where large agricultural enterprises are adopting regenerative farming practices
  - Europe, where strong policy frameworks support soil health and carbon farming
  - Southeast Asia, where improving soil productivity and climate resilience is a growing priority
- In terms of application fields, the technology is particularly relevant for:
  - Carbon farming and soil carbon credit projects
  - Scope 3 decarbonization initiatives in agricultural supply chains
  - Regenerative agriculture programs led by global food and beverage companies
  - Monitoring and verification systems for climate-smart agriculture
- By enabling large-scale and cost-efficient monitoring of soil carbon dynamics, Sagri's technology can support the transition toward sustainable and climate-resilient agricultural systems worldwide.

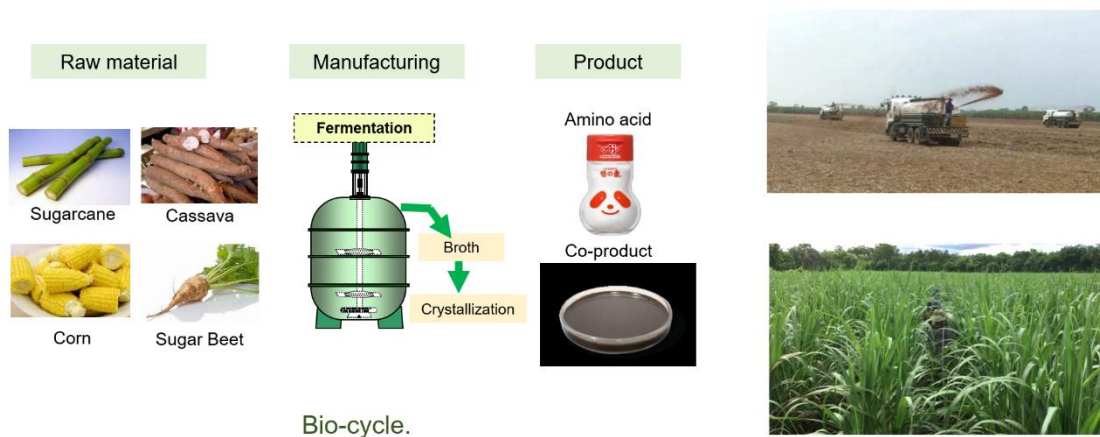
### 3. AJINOMOTO Co., INC.

#### Overview and Features of the Technology

- Leveraging its long-cultivated AminoScience®, Ajinomoto provides Biostimulants, a soil health improvement material that helps plants to reach their full potential.
- The company practices a large-scale bio-cycle (resource circulation) around its factories worldwide, where co-products generated during the amino acid manufacturing process from crops like sugarcane, cassava, and corn are returned to farmlands as raw materials for fertilisers.

#### The Way Ajinomoto Improves Bio-cycle

✓ Amino acids are made from crops and Co-products are used in crops.



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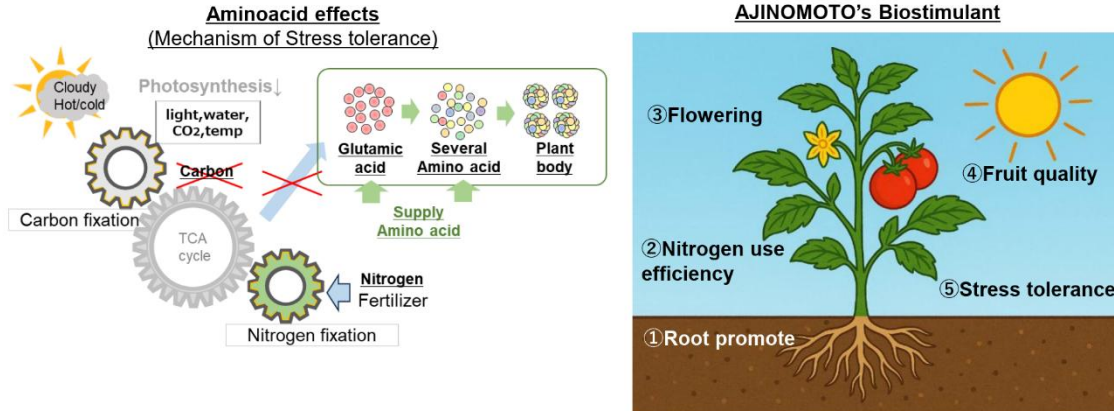
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#### Effects and Strengths in Problem Solving

- **Tolerance to Climate Change and Environmental Stress:** Biostimulants promote root growth, flowering, and nitrogen use efficiency, enhancing plants' tolerance to abiotic stresses such as heat and water shortage.
- **Improvement of Soil Water-Holding Capacity and Quality:** By activating soil microorganisms and enzyme activities, they improve soil aggregate structure, enhance the soil's water-holding capacity, and increase the efficiency of water and nutrient use.
- **Reduction of Environmental Impact and Yield Increase:** They achieve crop yield increases of up to 24% and quality traits improvements (such as up to 39% increase in wheat protein), while reducing water and chemical fertiliser usage by up to 25%.

## How Ajinomoto's Biostimulants Work

- ✓ Amino acids have Biostimulant effects.
- ✓ Use plant-base raw material such as Co-product (resource circulation)
- ✓ Effectiveness 1) Yield up 2) Quality improvement 3) Stress tolerance



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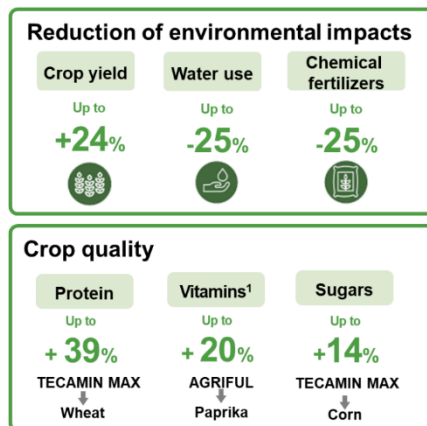
## Promising Regions and Fields for Future Expansion

- Promising Regions: Agricultural regions worldwide facing drought and extreme heat due to climate change, carrying the risk of yield reduction (already expanding business in more than 60 countries across Europe, Asia, Africa, and the Americas).
- Promising Fields: Ajinomoto promotes a two-way approach to build sustainable food production systems that require both greenhouse gas reduction (mitigation) with another product, called AjiPro™-L and enhanced tolerance to environmental stress (adaptation).

## Ajinomoto's Business Operations around the World

- ✓ Business in more than 60 countries.

Biostimulant market is double-digit growing due to increasing demand to address decreasing yields caused by climate change, etc.



<sup>1</sup> Source: APPLICATION OF ORGANIC PRODUCTS TO REDUCING MINERAL FERTILIZATION IN PEPPER(2016)  
Except for vitamins, all the data is in-house data.

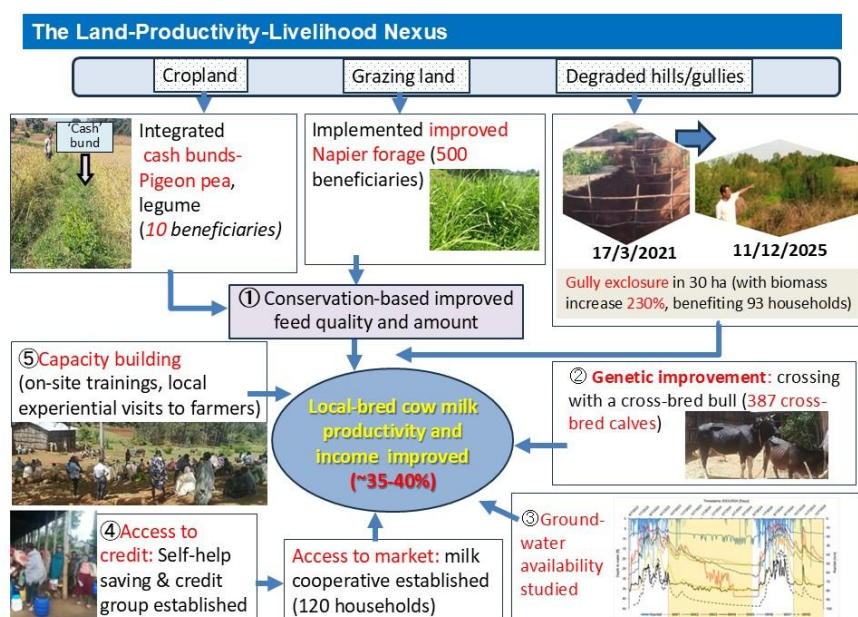
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## 4. International Platform for Dryland Research and Education (IPDRE), Tottori University

### Overview and Features of the Technology

- IPDRE has developed an evidence-based, Sustainable Land Management (SLM) framework for degraded landscapes in Ethiopia, linking soil erosion control, productivity improvement, and livelihood enhancement through 13 technologies and 4 approaches compiled in the SLM Guideline.
- The framework covers both watershed- and field-level planning, such as alternative land-use and management scenario development, soil improvement with PAM, and seedling production using beneficial soil microbes from church forests.
- The framework is implemented as an integrated package at the model watersheds, combining measures for cropland, grazing land, and degraded hillsides with improved forage, gully rehabilitation, livestock improvement, groundwater assessment, and local capacity building.



### Effects and Strengths in Problem Solving

- Based on scientific evidence and locally verified simple, low-cost technologies, these practices reduce soil erosion by 66% to 96%.
- Microbial inoculation increased seedling survival rates by 38%, and SLM implementation improved soil productivity by 49% to 134%, directly contributing to an approximately 35% income improvement for poor farmers.
- Additionally, it can be expected that vegetation cover, biodiversity, soil organic matter and fertility, and biomass production will increase through Soil Inoculation.



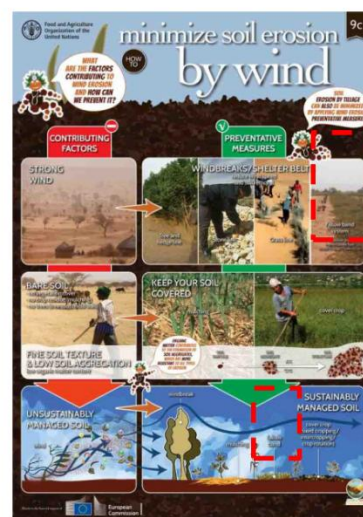
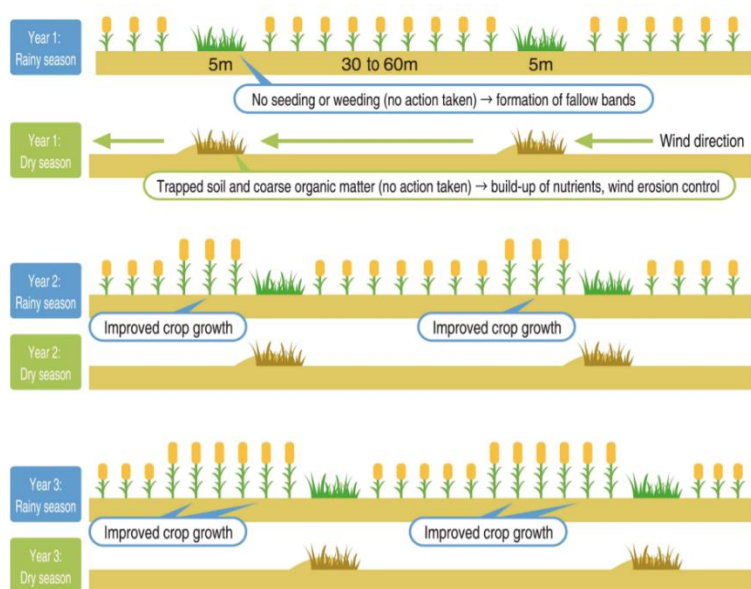
## 5. Japan International Research Center for Agricultural Sciences (JIRCAS)

### Overview and Features of the Technology

- JIRCAS develops and disseminates simple and low-cost agricultural technologies to combat salinization and wind erosion in developing regions.
- The Cut-Soiler is a technology that uses a tractor-drawn implement to cut V-shaped grooves in the soil and bury crop residues from the surface to construct shallow subsurface drainage.
- The Fallow Band System (FBS) is a technology that leaves uncultivated bands (fallow bands) in farmlands to trap wind-blown soil and coarse organic matter.

### Fallow Band System (FBS) (Ikazaki et al. 2011, 2017, 2023) JIRCAS

- Fallow bands shifted annually within fields to reduce wind erosion and increase yields
- Simple technology requiring no additional cost or labor to local smallholder farmers
- Selected as a promising wind erosion control measure by the FAO Global Soil Partnership



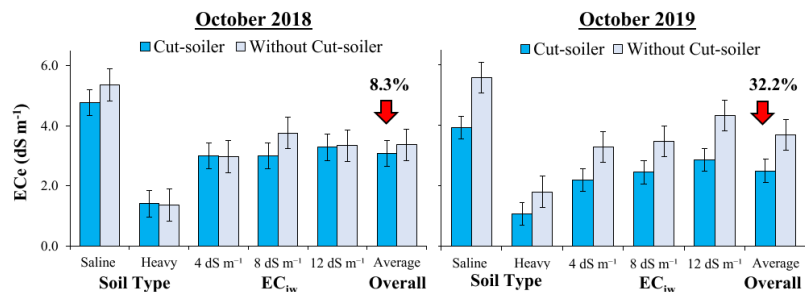
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### Effects and Strengths in Problem Solving

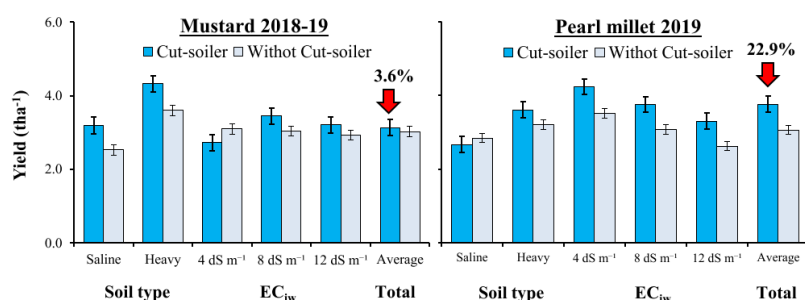
- The greatest strength is the simplicity and low cost, requiring no additional cost or advanced maintenance, making it highly applicable for local smallholder farmers.
- The Cut-Soiler decreases soil salinity (ECe) by 32.2% and increases crop yields (e.g., Pearl millet) by 22.9%.
- The FBS reduces wind erosion by 45% to 85% and increases crop yields by 25% to 70% by recycling the trapped nutrients (with a 74% continuation rate among adopting farmers after three years).

# Effects of Cut-Soiler

- After 1 year 4 months, soil salinity (ECe) decreased by 32.2%
- Yield of Pearl millet increased by 22.9%



Changes in soil salinity ECe (dS m<sup>-1</sup>) from October-2018 to October-2019



Grain yield (t ha<sup>-1</sup>) of mustard (2018-19) and pearl millet (2019)

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## Promising Regions and Fields for Future Expansion

- Arid and semi-arid regions (e.g., India) where salinization is progressing due to irrigation agriculture, ie, high saline groundwater and/or poor drainage.
- The Sahel region in West Africa (e.g., Niger, Burkina Faso, Mali, Senegal, Nigeria), where land degradation caused by wind erosion is severe.