Supplementary Information Item for WP1: Infographic Compilation

Supporting Enhancing Biodiversity and Resilience in Intensive Farming Systems Report

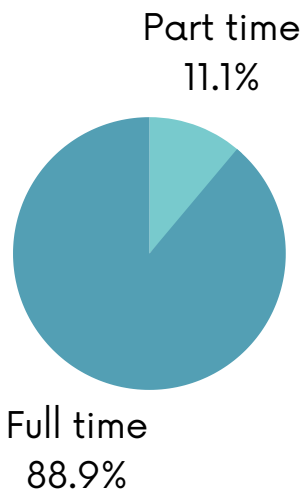
ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

BRAZIL CASE STUDY

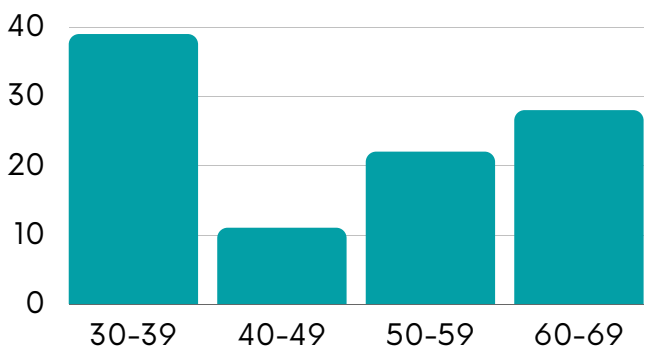
RESPONDENTS' INFO

GENDER

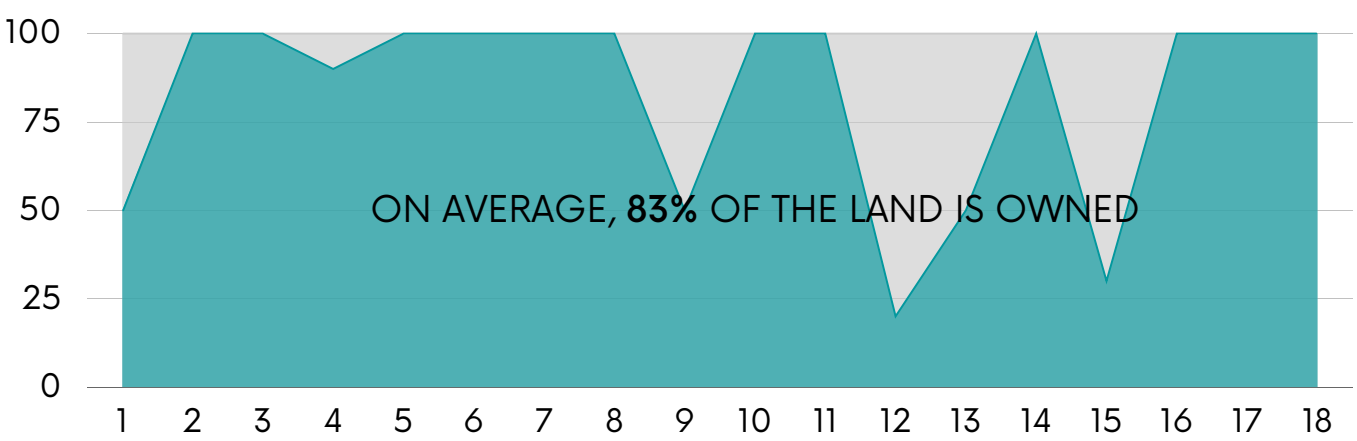
ACTIVITY



AGE DISTRUBUTION (%)

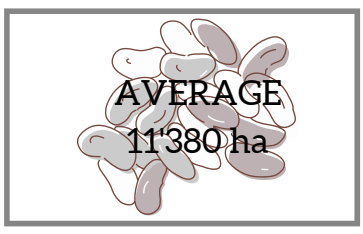


LAND OWNERSHIP



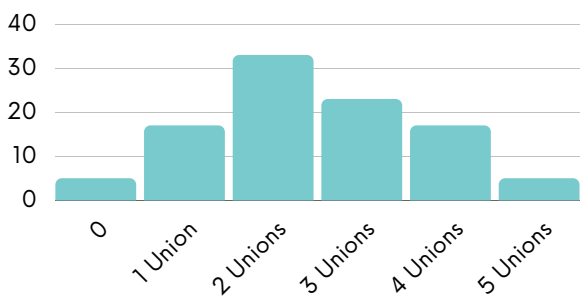
FARM SIZE

Min
70 ha

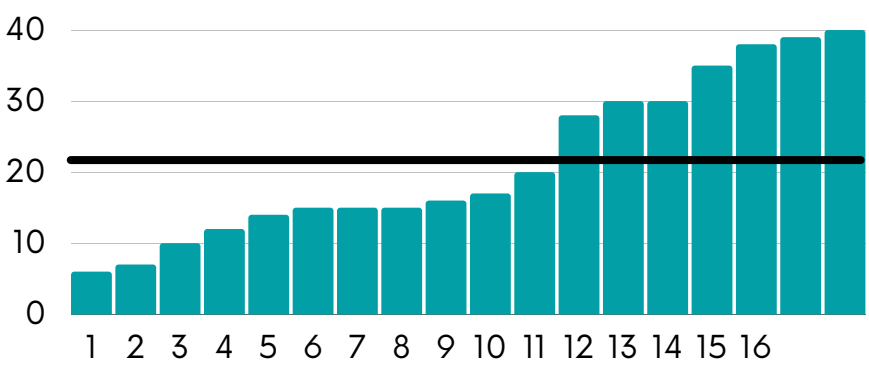


Max
37'000 ha

PARTICIPATE IN UNION.S (%)

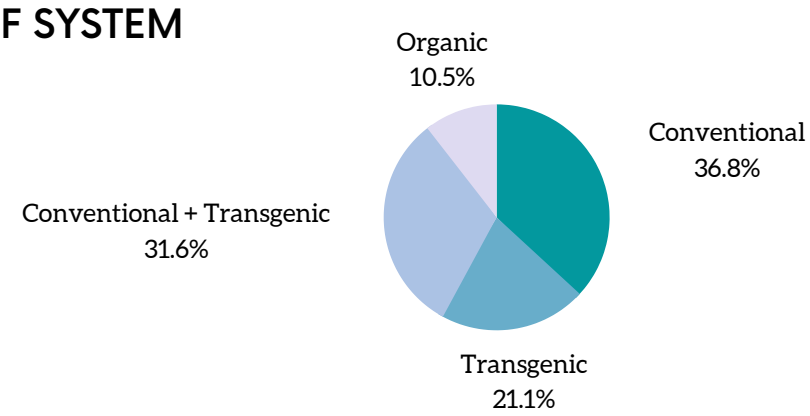


YEARS EXPERIENCE IN AGRICULTURE



21.5 YEARS AVERAGE EXPERIENCE IN AGRICULTURE

TYPE OF SYSTEM



AVERAGE CROP GROWN

Contact : Ana Paula Cervi Ferez, apferez@gmail.com ; Pedro Brancalion, pedrobrancalion@gmail.com ; Adelaine Cézar, adelainecezar@gmail.com ; Wei Zhang w.zhang@cgiar.org

ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

PERCEPTION OF BIODIVERSITY

For farmers, biodiversity refers to different aspects:

- Equilibrium of a variety of plant, insects, and animals
- Maintenance and restoration of preservation areas
- Diversity related to fauna and flora
- Life and microorganisms within soil

"Biodiverity refers to the preservation of the environment as well as conservation of water resources to attract mainly fauna and flora."

BENEFITS OF BIODIVERSITY

- Soil quality and conservation
- Cost savings through reduced chemical inputs

DECISION-MAKING CRITERIA

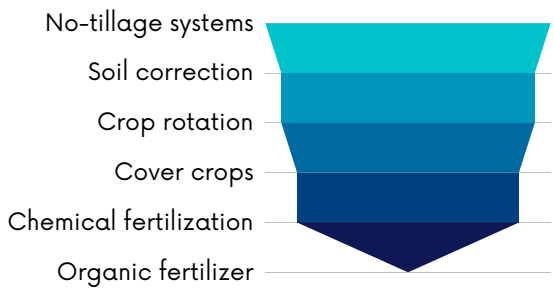
Gain in production

Decreasing costs

Environmental beliefs

BIODIVERSITY IN PRACTICE

What are the most common pratices on-farm?



REGIONAL SUPPORT

Farmers ideas for increasing regional support for biodiversity:

- **Share best practices** and positive results from biodiversity enhancing practices more widely.
- Increase **research** on biodiversity enhancing practices.
- Incorporate **local and farmer input** on efforts designed to improve biodiversity.
- Increase **financial support** and incentives for those who adopt biodiversity enhancing practices.

PUBLIC POLICIES & PROGRAMS

PARTICIPATION

13 out of 18 farmers indicated that **they had experience** with policies and programs that are designed to support biodiversity.
Their main motivations for adoption are capital demand and cost savings.

DISADVANTAGES

Farmers perceive that the government does **not directly contribute** to production and that there is no effective coordination actions for conservation purposes.

LIMITATIONS

Lack of freedom to choose their practices and implementation

Too restrictive laws and regulations

SOLUTIONS

More financial incentives for those who adopted policies and programs such as additional lines of credit, attractive interest rates, and market rewards.

Greater disclosure, articulation, and publicizing of biodiversity enhancing policies and programs.

Further research on biodiversity enhancing practices for each location and greater regulation for biological products.

TRENDS

Trend to use **biological products** to reduce the use of pesticides.

Integration systems such as ILPF (crop-livestock-forest) are still marginal.

CHALLENGES

Some presented the challenges of maintaining the **Legal Reserve**, especially related to forest fires.

"Our major obstacle are our costs of maintenance of a productive chain, e.g. keeping the legal reserve in the period of the drought, which is susceptible to risk of forest fires."

ASPIRATIONS & VISIONS

What would be your ideal property?

- Incorporates new technology such as Integrated Crop-Livestock-Forestry Systems
- Increased profitability and decreased costs
- Includes a biological factory

MAIN OBSTACLES

27.7 % of farmers said they were challenged by **governance issues.**

33.3% of farmers said that **economic obstacles** prevent them from achieving their desired future farm state.

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ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

FRENCH CASE STUDY

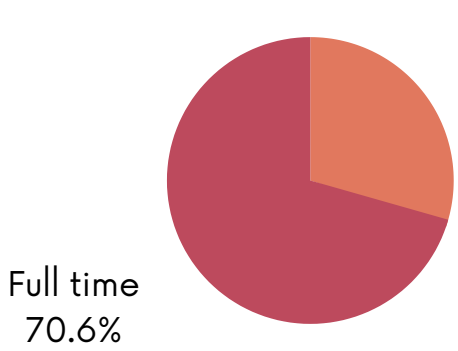
RESPONDENTS' INFO

GENDER

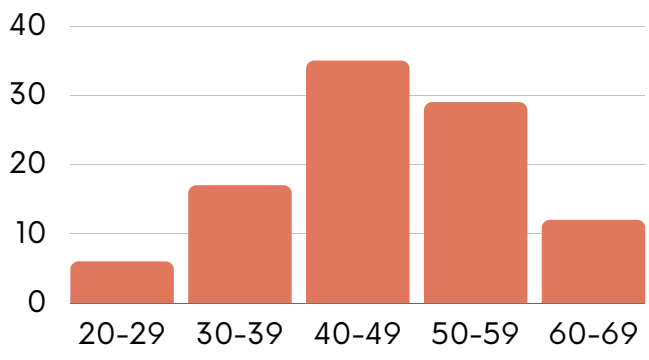
18 PARTICIPANTS

Every respondent interviewed is part of a GIEE (Environmental and Economic Interest Group). This group of farmer represents **6%** of the farming population in Hauts-De-France, France

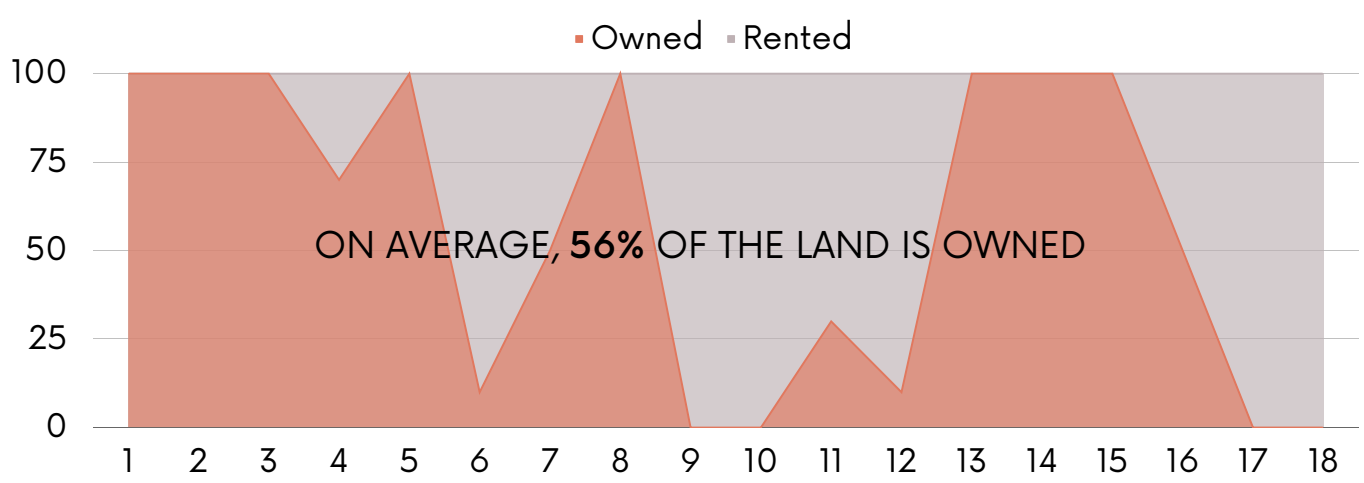
ACTIVITY



AGE DISTRUBUTION (%)



LAND OWNERSHIP



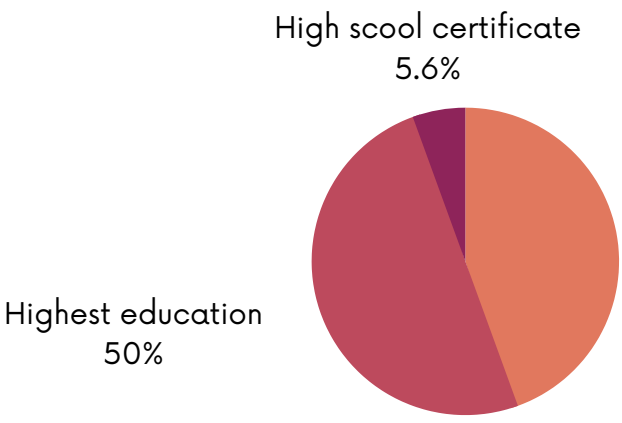
FARM SIZE

Min
110ha

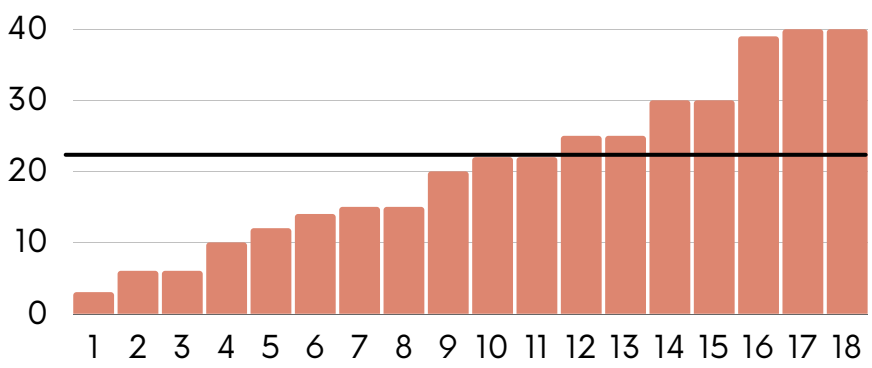
Max
820ha

AVERAGE 244 ha

EDUCATION

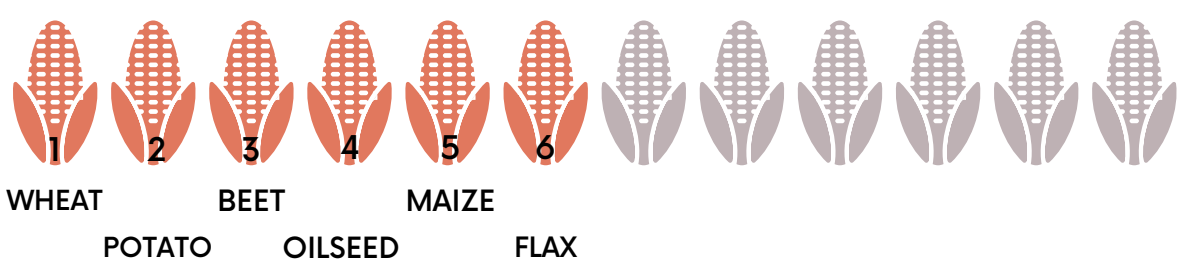


YEARS EXPERIENCE IN AGRICULTURE



22 YEARS AVERAGE EXPERIENCE IN AGRICULTURE

AVERAGE CROP GROWN



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ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

PERCEPTION OF BIODIVERSITY

Definition of BIODIVERSITY:

- soil fertility
- microorganism and insects
- pests and auxiliaries,
- crop diversity,
- all the flora and fauna composing their ecosystem

"The aim is to try to do our best to maximize this biodiversity"

Some respondents mention biodiversity as **useful** and **harmful** at the same time. They aim to improve useful biodiversity (positive) in order to fight against pests and diseases (harmful biodiversity).

"One part of biodiversity is useful for crops, and the other part is kind of harmful diversity, such as pests. Then we have to try to put things in place to increase this positive biodiversity as much as possible, which can be a bulwark against harmful biodiversity"

They aim to increase biodiversity but **not** to the extent of economic loss.

"After all, these experiments in our system must remain profitable and financially viable"

DRIVERS OF CHANGE

MOTIVATIONS

- **Personal values**
- **Reducing costs:** yields have reached a plateau and inputs are becoming more expensive.
- **Climatic event & soil erosion** have led to yield losses, which triggered farmers to question conventional agriculture.
- **Learning & curiosity**
- **Generational change**

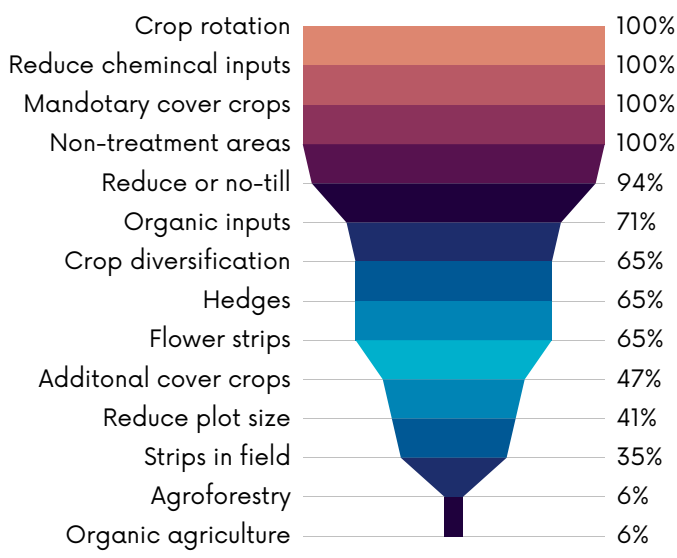
"You have to realize that there is a large generational element which plays a role in the change. My father did it like that, I continue to do it like that"

LIMITATIONS

- **Time consuming**: practices in favor of biodiversity require more time in the field, mainly for observation and maintenance (e.g., hedges).
- **Costs**: investment into new machinery as investment into plants (hedges) and seeds (for crop diversification and for cover crop)
- **Additional administration and controls:** respondents perceive new CAP and public policies as supplementary controls over their work. Controls could lead to suppression or reduction of their subsidies.
- **Industrial crops**
- **Losing performance**: some participants were afraid not to be able to maintain their yield while reducing their inputs
- **Lack of labor**

BIODIVERSITY IN PRACTICE

What do farmers implement on-farm?



PUBLIC POLICIES & PROGRAMS

EUROPEAN SUBSIDIES

All farmers receive **CAP subsidies**, but they feel under surveillance (satellites etc) and fear losing a part of these subsidies.

"Because at the end of the day, we are still very closely surveilled, especially in relation to CAP subsidies"

NATIONAL SUBSIDIES

"We don't expect anything from them"

A majority of farmers **have lost trust** in the government and its policies. They feel that policies are **not-well designed** and not **to scale (44%)** (restrictive zoning, restrictive category of access, windfall effects). Government systematically imposes new constraints, new regulations, a lot of **bureaucracy and controls (39%)**.
Yet, **33%** of our respondents have applied and received **subisides for new machinery.**

SOLUTIONS

Respondents call for more freedom, autonomy and independence in their work. They would like to see **objective-oriented policies** instead of being told what to do at each step of their work.

GIEE

All of our respondent take part in **working groups** so called **GIEE** (Economic and Environmental Interest Groups)

Its advantages: farmers receive advice, they can define their own objectives, can work in groups, share trials and experience. It also reduces the feeling of loneliness front of risk-taking.

ASPIRATIONS

SOIL CONSERVATION AGRICULTURE — **89%**

It is a **technical** challenge. They like that it does not come with a strict dogma, that they can define their own objective without being restricted.

HIGH ENVIRONMENTAL VALUE (HVE) — **50%**

This certification seems to emerge as an **alternative option**, between conventional and organic agriculture. They work in groups towards technical objectives, receive advice and some subsidies. *Disadvantages: French certification, no financial bonuses*

CARBON CREDITS & PAYMENT FOR ECOSYSTEM SERVICES — **27%**

Some respondents have started to develop partnership with the **private sector** to bring further income and value to their farm.

AGROFORESTRY — **17%**

Two respondents mention agroforestry as a **long-term project.**

ORGANIC AGRICULTURE — **6%**

Most respondents do not believe in a 100% organic farming. They believe that market outlets are saturated, specifications are **too restrictive**, and it requires work they wouldn't like to do themselves, e.g. manual weeding.

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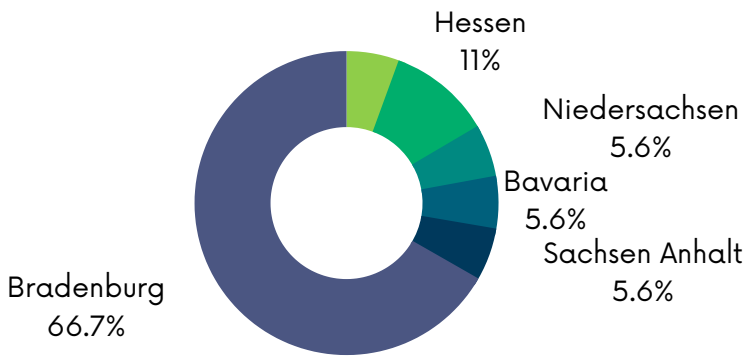
ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

GERMAN CASE STUDY

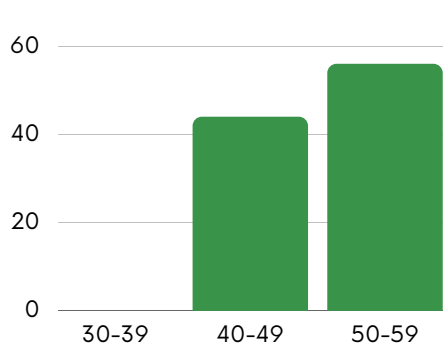
RESPONDENTS' INFO

GENDER

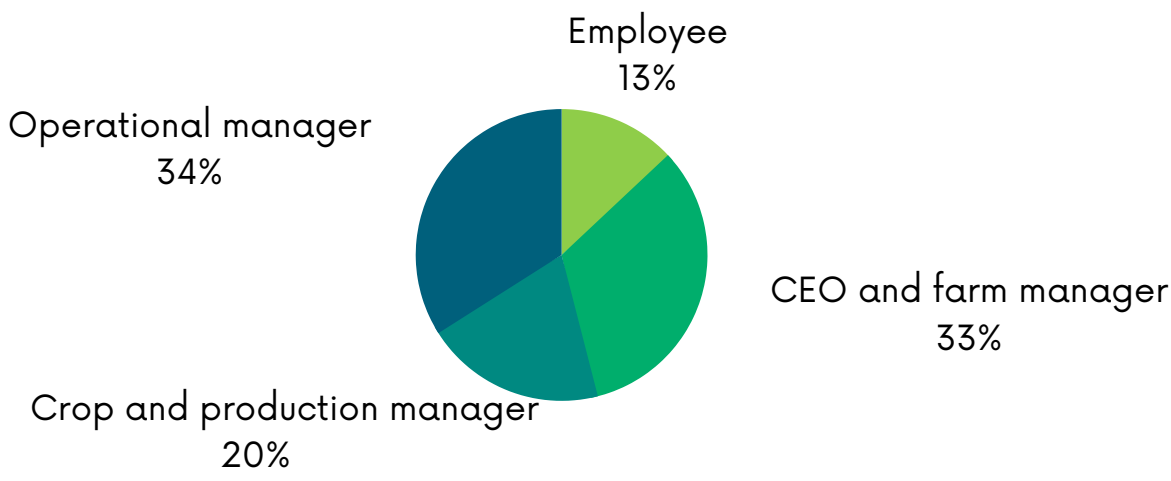
DISTRIBUTION PER REGION



AGE DISTRUBUTION (%)



ROLE ON THE FARM



All farms are mostly conventional farms. However, some farm had some organic livestock or pastureland

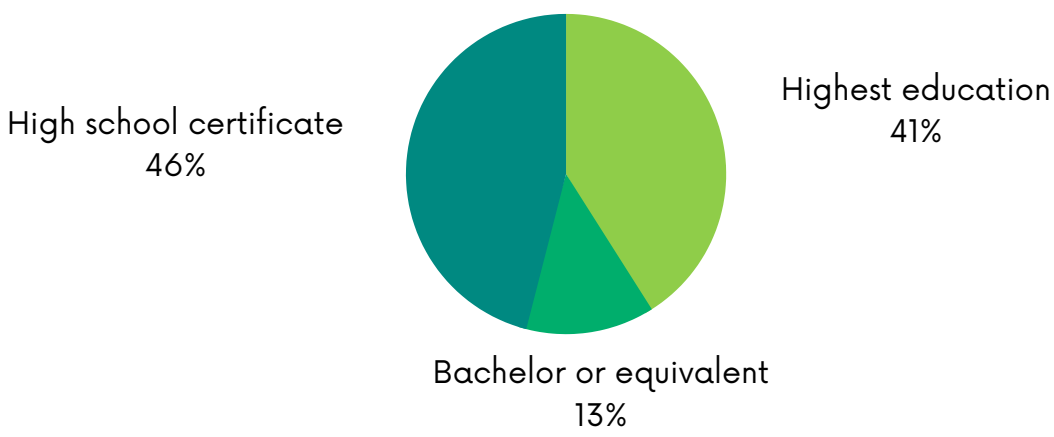
FARM SIZE

Min
40 ha

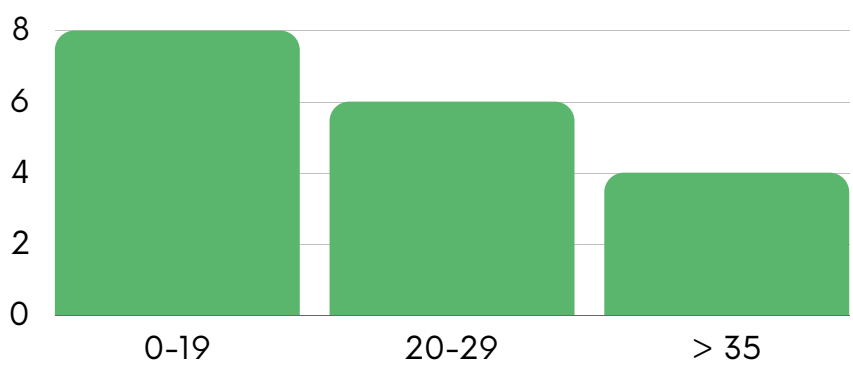
Max
5700 ha

AVERAGE 3900 ha

EDUCATION

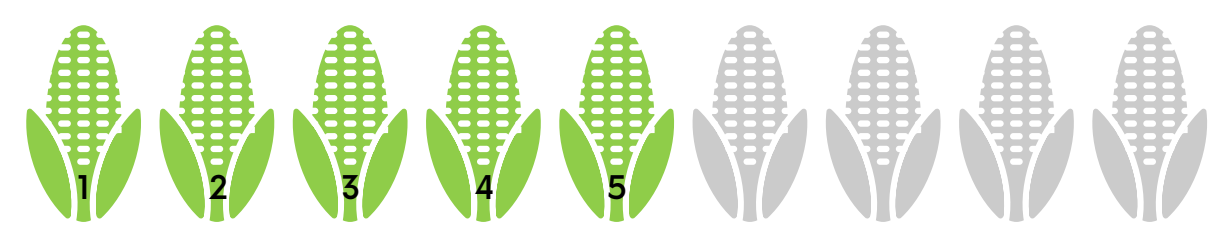


YEARS EXPERIENCE IN AGRICULTURE



55 % FAMERS HAVE A WORK EXPERIENCE ABOVE 20 YEARS

AVERAGE CROP GROWN



Contact : Fatima Lehnhardt, Fatima.Lehnhardt@zalf.de ; Peter Zander, Peter.Zander@zalf.de ; Wei Zhang, w.zhang@cgiar.org

ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

PERCEPTION OF BIODIVERSITY

BIODIVERSITY is related to farm management & crop diversification:

- flowering strips
- intercrops
- crop rotation
- Diversity of soil organisms, insect, animals and plants
- Diversity of crops

Disadvantages of an increase in biodiversity: pest insects, wolves and economic disadvantages

Increasing the diversity of crop rotations is something most farmers want to do but **lack marketing opportunities**

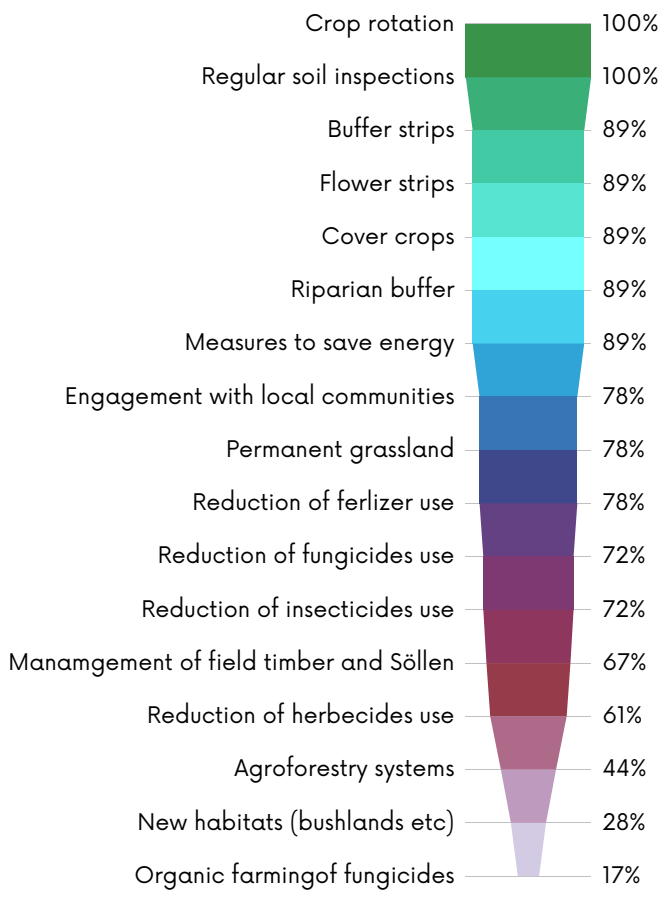
" And what is important is marketing. There has to be a market for everything."

Cover crops are perceived to have a positive effect on soil fertility, but farmers mention difficulties in finding the right crops and establishing a system that works for them:

"About cover crops, you also have to be careful with the species which can survive in our region, whether it works or not in our region"

BIODIVERSITY IN PRACTICE

What biodiversity measure is considered as highly effective according to farmers?



PUBLIC POLICIES & PROGRAMS

SUBSIDIES

Almost all farmers receive subsidies for **flowering strips.** Some farmers are additionally involved in **local/regional programs** (KULAB, Verein Rheinische Kulturlanschaft, other state funded programs)

ADVANTAGES

Respondents acknowledge that these new programs and regulations **have improved agricultural practices** a lot compared to previous generation, in regards of sustainability.

Farmers take into account the type of subsidies, the costs, the practicability of a program when deciding to join.

Farmers see their involvement in the **local community** (e.g. school visits) and **knowledge sharing** with the neighboring farms as an **important** part of their work. Farmers in Brandenburg often see people from Berlin as their target group.

DISADVANTAGES

Time spent in the office for administration is constantly increasing

"All this paperwork has to be kept as light as possible"

Stricter monitoring and little flexibility

"In terms of control, we are flown over once a week and they record everything we do or do not do on the field or how does it look or does not look like."

Fast changes in regulations (nearly every year)

"Now for every little thing there is a new regulation and again an innovation and everything is pulled tighter"

SOLUTIONS

Respondents call for more freedom, autonomy and independence when implementing biodiversity enhancing practices. They call for **objective-oriented policies** & **flexible funding applications.**

ORGANIC AGRICULTURE

Respondents are **not against** organic agriculture but choose conventional for:

- Financial reasons
- They believe organic agriculture can not feed the world.
- They choose the **land sparing approach** (vs land sharing). Preference for intensive agriculture to leave plots for flowerings strips.

DRIVERS OF CHANGE

MOTIVATIONS

- **Economic reasons**: monetary gains
- **Healthy ecosystems**
- **Generational changes**: handing over healthy soils to next generations

LIMITATIONS

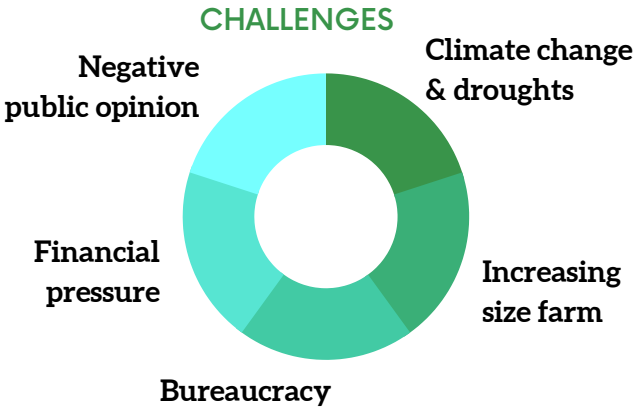
- Increasing level of bureaucracy
- High prices for local mixtures seeds
- Financial losses (inputs, investments, lower yields)
- Lack marketing opportunity
- Practicability
- Availability of seeds

ASPIRATIONS & CHALLENGES

Success was mostly defined in **financial terms.** **Personal happiness** was also considered very important.

Levers to success:
Technical innovation, policy changes, changing market prices, direct marketing & the establishment of local production chains

CHALLENGES



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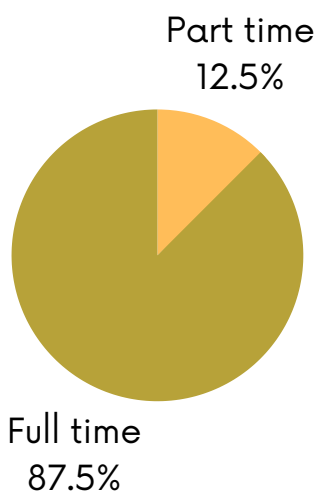
ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

UNITED STATED CASE STUDY

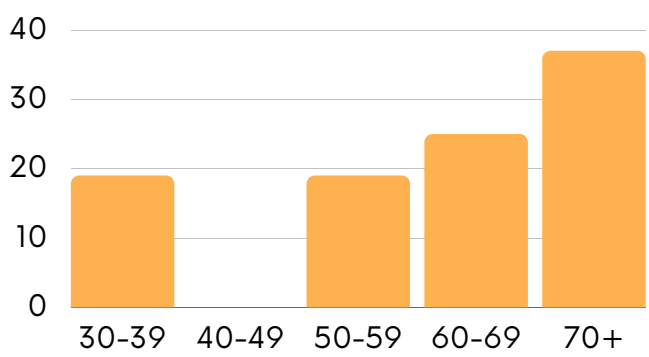
RESPONDENTS' INFO

GENDER

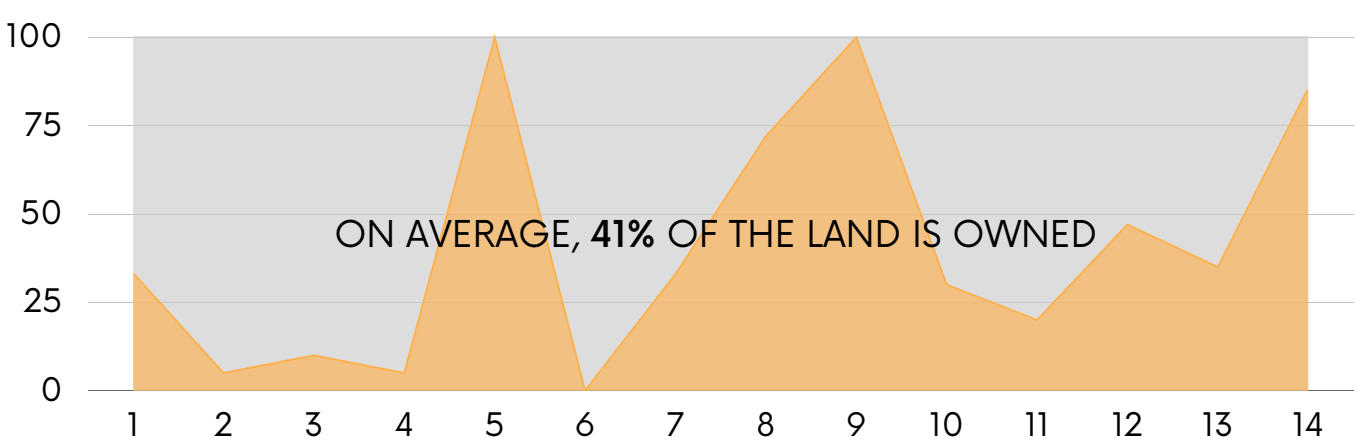
ACTIVITY



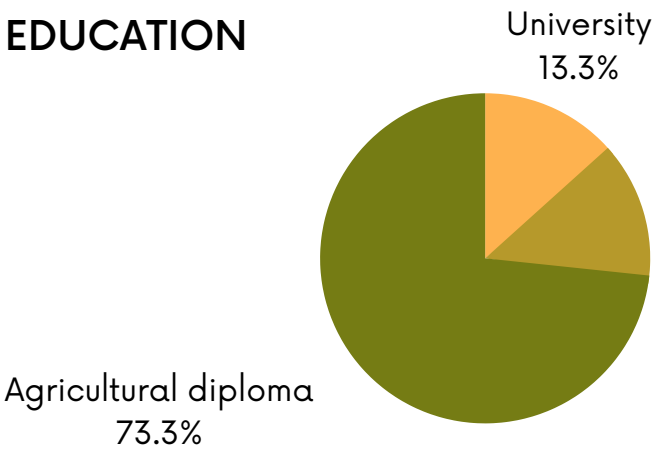
AGE DISTRUBUTION (%)



LAND OWNERSHIP



EDUCATION



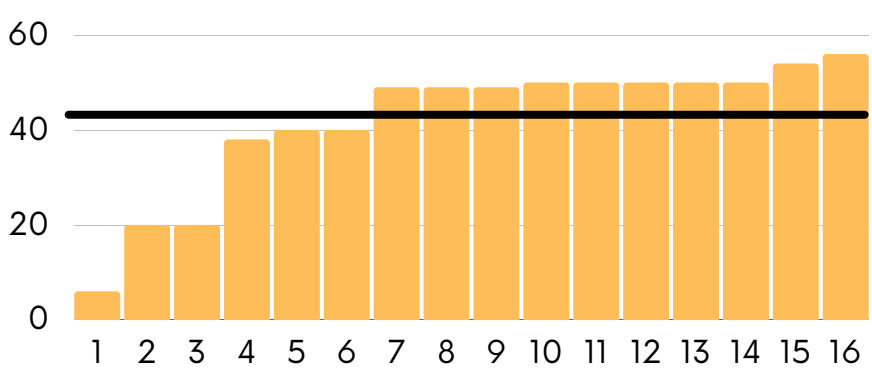
FARM SIZE

Min
115 ha

Max
2020 ha

AVERAGE 582 ha

YEARS EXPERIENCE IN AGRICULTURE



42 YEARS AVERAGE EXPERIENCE IN AGRICULTURE

AVERAGE CROP GROWN

Contact : Michael Castellano, castelmj@iastate.edu ; Wei Zhang, w.zhang@cgiar.org

ENHANCING BIODIVERSITY AND RESILIENCE IN CROP PRODUCTION

PERCEPTION OF BIODIVERSITY

Interviewees demonstrate an **understanding** of biodiversity. Several defined biodiversity as various forms of life existing together in an area:

"Biodiversity to me means all walks of life. Coexisting together on earth."

Overall, a majority of farmers expressed the **positive outcomes** that could potentially result from biodiversity enhancing practices during some point of their interview.

"Biodiversity has allowed us to become better stewards of the land. We feel that we are improving not only soil health, but also improving water quality by reducing the amount of runoff, both soil and nutrients, that have the potential to leach and wash away."

What biodiversity enhancing practices they would incorporate on their farm if costs and practicality were not a factor?

62.5% respond cover crops

PUBLIC POLICIES & PROGRAMS

PARTICIPATION

15 out of 16 farmers stated that they were currently participating or had previously participated in **government policies or programs** designed to support conservation practices.

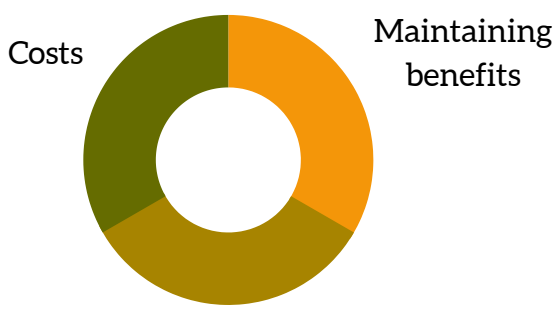
LIMITATIONS

Several farmers also noted that although government support exists to encourage the adoption of biodiversity enhancing practices, it is **limited** and financial support must be **increased.**

"We have a problem of governmental programs throwing money at producers on short-term practices where the producer leaves the practice. As soon as payments stop. We need commitment towards long-term adoption."

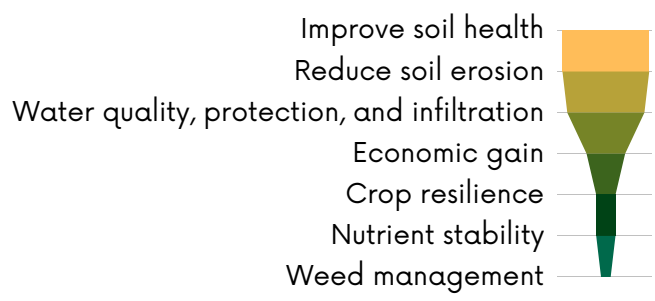
LIMITATIONS

What are the main limitations to further adoption of biodiversity enhancingt practices ?



POTENTIAL OF BIODIVERSITY

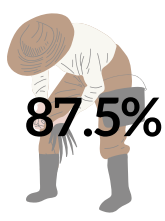
What are the potential benefits of biodiversity enhancing practices ?



BIODIVERSITY IN PRACTICE

What do farmers implement on-farm?

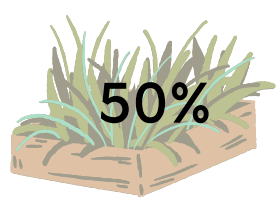
COVER CROPS



NO-TILL

CROP ROTATION

BUFFER STRIP



FARMERS' PERCEPTION OF OTHERS

CHALLENGES

Several farmers noted that although neighbors seem willing to adopt, they experienced challenges that influenced their adoption.

"Most of them are open-minded about incorporating biodiverse conservation practices, are concerned about protecting the environment, but also are equally concerned about the risk to their bottom line."

CURIOSITY

Farmers noted that neighbors understand biodiversity enhancing practices are beneficial but do not **take the time** to implement them on their farm

"We often get questions regarding practices that we have implemented. It's something others will try for a season, get frustrated because of not understanding the different management style and go back to what they were comfortable with."

RETURN ON INVESTMENTS

Many farmers referred to return on investments as a key factor for adoption or mis-adoption of biodiversity enhanced practices:

"Unfortunately, many large cash rent farmers dominate our area. Many of which are unwilling to commit to long-term conservation practices while having short-term cash rent leases."

ASPIRATIONS & VISIONS

COVER CROPS

E.g. 31.25 % of farmers said they would like the future state of their farm to increase **cover crops**

CONSERVATION

3 farmers noted they would like their future farm to be environmentally friendly or emphasize conservation.

MARKET OPPORTUNITIES

"We hope that market prices and input costs would remain stable so that we can always **sustain financial stability.**"

MAIN LIMITATION TO THE IDEAL FARM

Financial limitations

"Has to be economically compelling."

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