# The value of species diversity in grasslands (DIVERSGRASS)

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## 1 Introduction

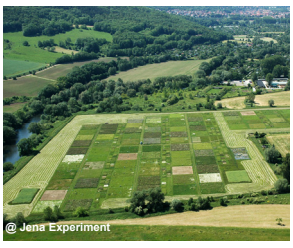
- Grasslands play a central role in global food security as they cover major shares of world's agricultural area [1].
- Species diversity (diversity) increases and stabilizes biomass yields [2,3,4,5].
- Need for evaluating the diversity effect from farmers' perspective and transforming it into economic terms.

## 2 Research question and method

- "**What is the value of species diversity in grassland production considering ecological and economic aspects?"**
- More specifically the following aspects will be addressed:

| a) | b) | c) |
|---|---|---|
| The influence of diversity on forage production and risk. | The mitigating effect of diversity on negative yield impacts due to climatic extremes. | Interdependencies between agricultural policies, insurances and diversity. |

- Econometric analysis using different rich experimental datasets (Jena Experiment, COST Agrodiversity Experiment, AnimalChange Experiment)
- The diversity effect is transformed into revenue by using milk production equivalent or hay yield and respective prices.


## 3 Preliminary results and discussion

**The influence of species diversity on forage production and risk**

- ***Project 1:*** Diversity effect across management regimes (**Fig. 1**) [6]:
  - Diversity increases quality forage (quantity × quality) production, thus revenues from milk sales.
  - The marginal value of product of diversity (= added revenue by increasing diversity) decreases with higher diversity but remains always positive.

- ***Project 2:*** Diversity effect on expected revenue and insurance value in intensively managed grasslands across Europe [7]:
  - Higher diversity leads to increased milk revenues.
  - Diversity has a positive insurance value for risk adverse farmers.

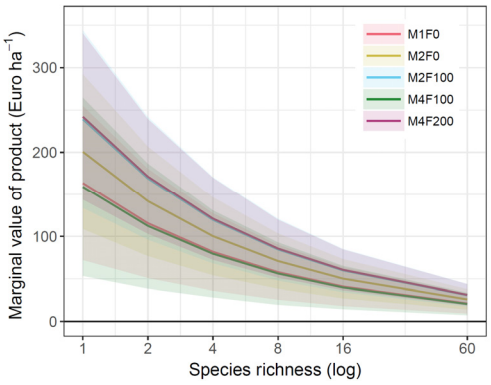



**Figure 1**. Marginal value of product of diversity (Euro ha$^{-1}$) and 95% confidence interval. M indicates frequency of mowing and F amount of fertilizer use, e.g. M2F0 indicates two cuts and no fertilization. All results are significant at the 1% level based on the delta method. Standard errors are corrected for heteroskedasticity.

## 4 Conclusion

- Farmers benefit from higher species diversity because
  - quality forage production, hence revenues, increase with diversity and
  - production risk decreases with diversity.
- Findings can be used as decision basis for farmers and policy makers to sustainably intensify grassland production.

## 5 References

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