

# Comparison of Life Impact Assessment Methods in a case of crop in northern France



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## Introduction

Agribalyse® is an initiative launched by the French authorities in order to develop a public LCI database of agricultural products in France.

Although the Agribalyse® project has resolved partially issues resulted from data gaps in LCI databases for agricultural products in France, it does not explain sufficiently which is the better LCIA method adjusted to the agri-food products.

### **What LCIA method we should to use?**

A review of the LCA papers in the agri-food sector is not clarified that LCIA method is the most appropriate to the features of the agricultural sector.

## Methods

### **Application case of study**

- **Scope:** Agricultural practices for chicory root harvested from 2010 to 2012.
- **FU:** "1 tonne of chicory root arriving in drying plant".
- **Agricultural practices:** stubble ploughing, loosening, grinding, ploughing, hoeing, sowing, crop protection agent (pesticide application), fertiliser (fertilising), grubbing-up and transport to drying site.

### **Choice of LCA methods**

A review of the proceedings of the LCA Food 2012 [1] was done to find an appropriate or agreed LCIA method to the agricultural sector, but this search revealed the **absence of prevalence of a LCIA method.**

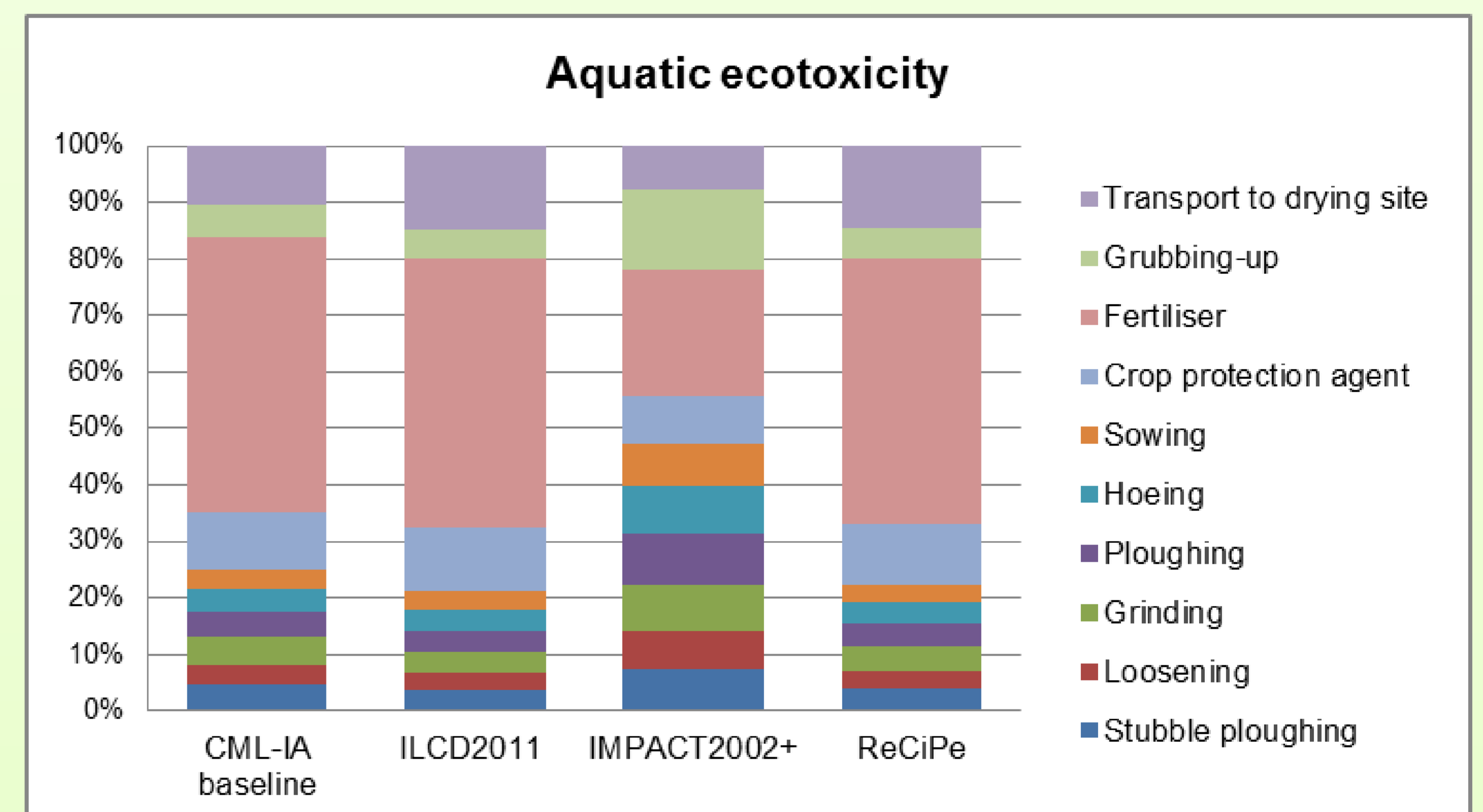
Selected LCIA methodologies: CML-IA, IMPACT2002+, ReCiPe and ILCD2011.

[1] Corson, M.S., van der Werf, H.M.G. (Eds.), 2012. Proceedings of the 8th International Conference on Life Cycle Assessment in the Agri-Food Sector (LCA Food 2012), 1-4 October 2012, Saint Malo, France. INRA, Rennes, France.

## Results and Discussion

### **Aquatic ecotoxicity**

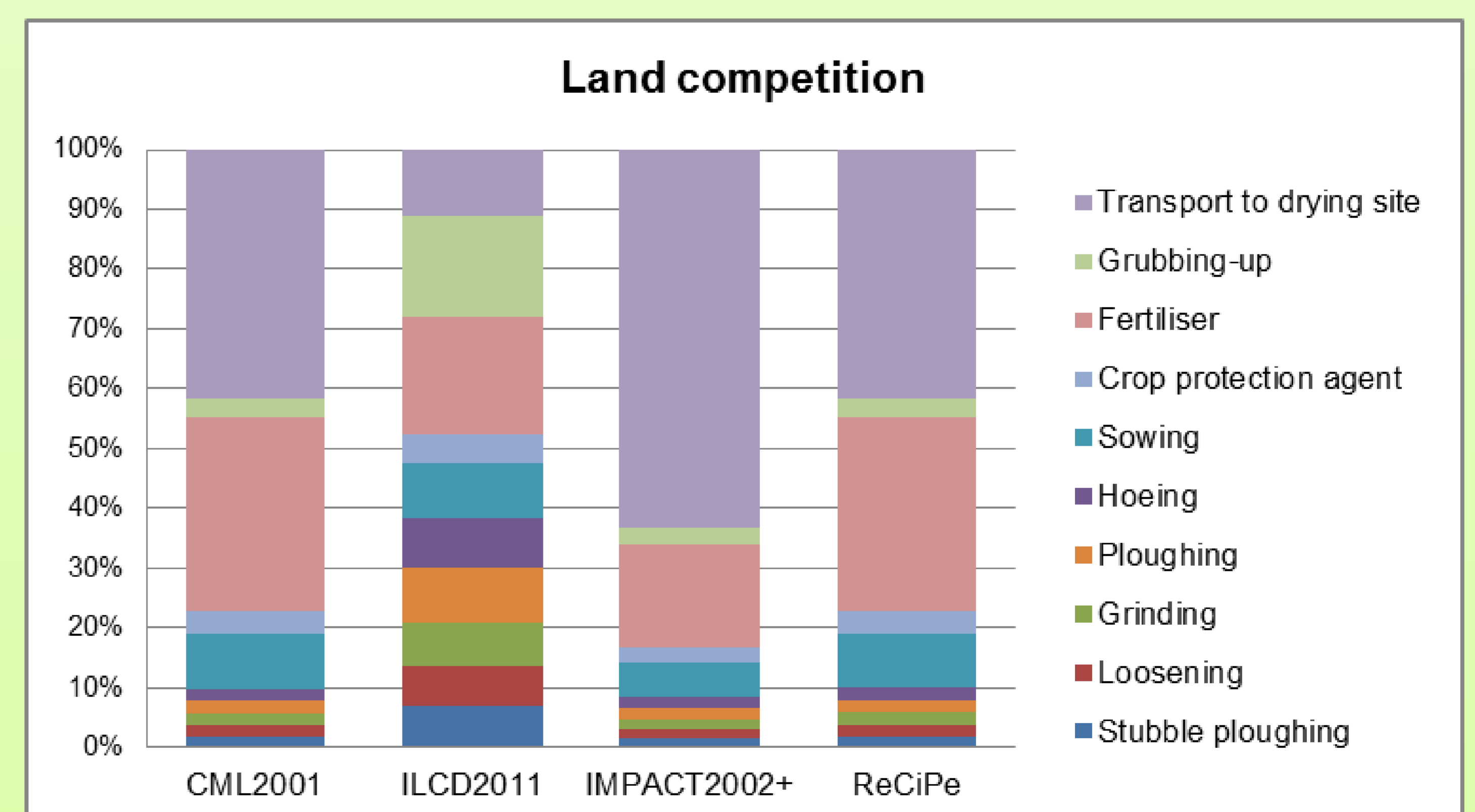
Results from IMPACT2002+ method without comparison with results obtained from other methods, could lead to underestimate the importance of the stage of fertilization.



Contribution of several stages process of the chicory root life cycle to the aquatic ecotoxicity indicator results of each LCIA method

### **Land competition**

The ILCD2001 method distributes the burden evenly between the process stages, while the other 3 methods show the stage of transport to drying site and fertilization as the most important. Ex. Environmental impact of transport to drying site: for IMPACT2002+ is 5,7 times bigger than using ILCD2011.



Contribution of several stages process of the chicory root life cycle to the land competition indicator results of each LCIA method.

## Conclusions

- Agribalyse® defines a scope of study and a LCI database specific to the French agricultural systems, but it does not provide a simple and operational LCIA method, leading to choose other usual methods.
- **The results can change depending on the calculation method used.**