

# Prospective study on the evolution of agricultural techniques

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# Who are we?



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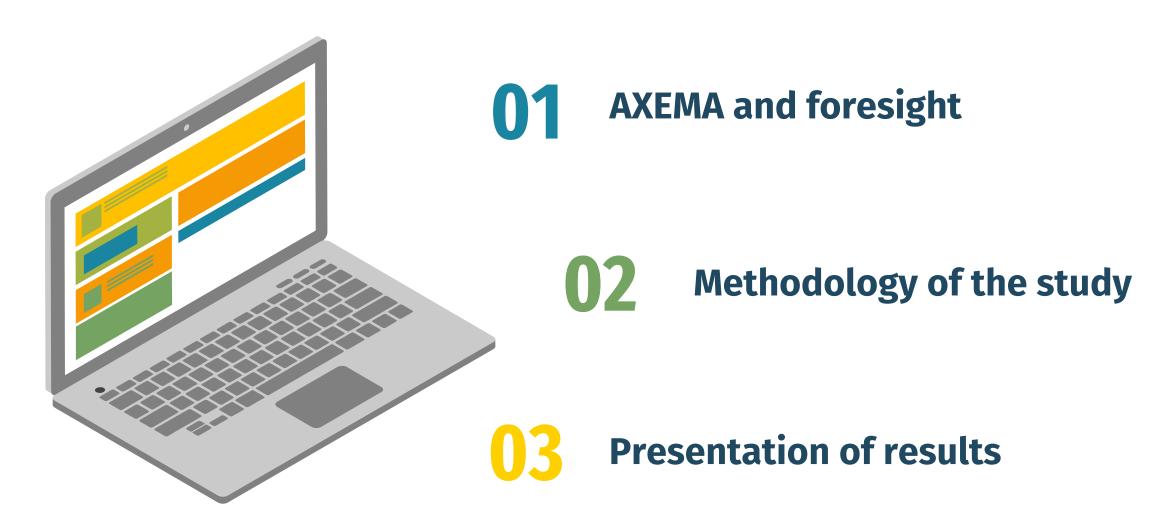


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Mechanical engineer / UTC

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# **Plan**





# A trade union representing the agricultural equipment sector

**AXEMA** in figures is...



# The foresight...

Is a set of research studies concerning the future evolution of societies and allowing the identification of elements for reflection.



#### IS LINKED TO THE TIMES

The future is open to **several development scenarios** 

The future is **rooted in the past and present** 

# ALLOWS YOU TO ANSWER THE QUESTIONS

What can happen? → **exploratory dimension** 

What can I do? → **strategic dimension** 

# Choice of the subject of the foresight study Weed control



### Social

Impact of chemical weed control techniques on farmers' and public health



### **Environmental**

Impact of chemical weed control techniques on water and soil pollution and on biodiversity



### **Economic**

Impact of practices on yields and food prices

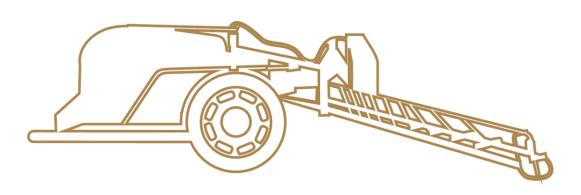


### Issue & sub-issues

What will be the weed management techniques in field crops in France by 2035?

01

What are the current weed management techniques?



02

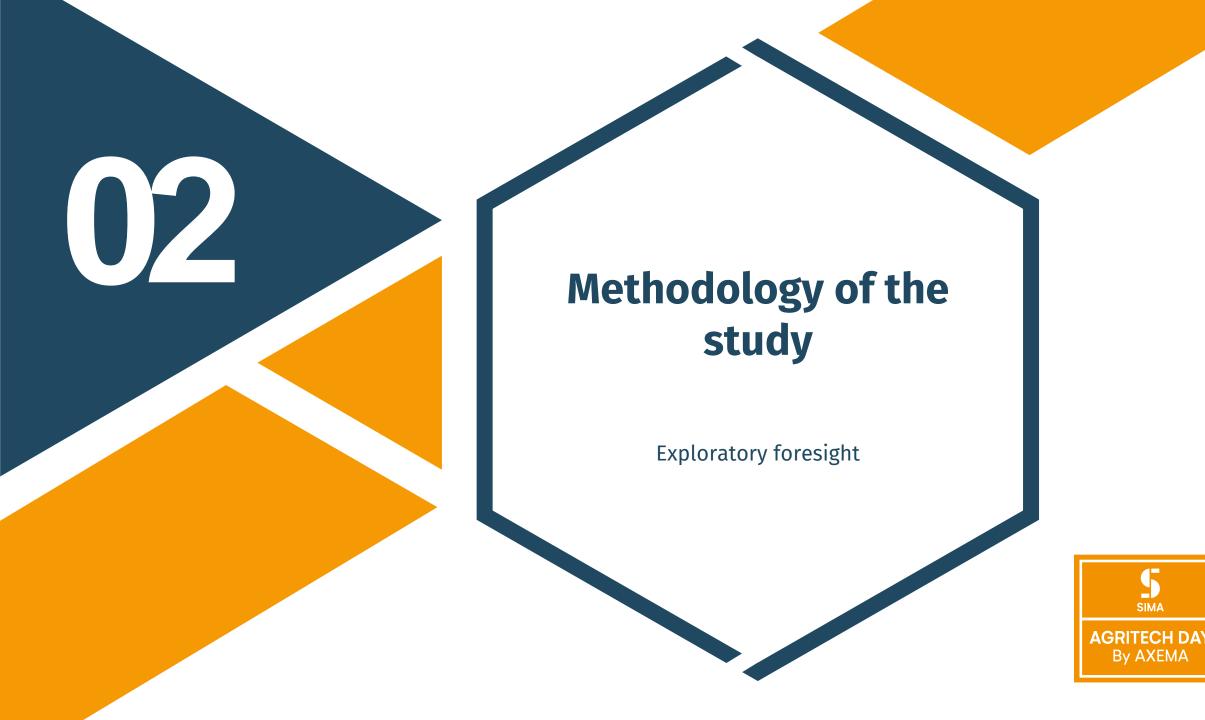
What are the main variables influencing weed management techniques?

03

What are the hypotheses for the evolution of the variables in 2035?

04

What are the possible scenarios when combining the different variables?



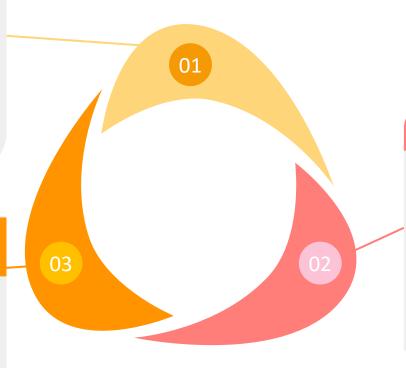
# The stages of a prospective process

#### Understanding the present

- Identify key issues
- Define the system
- Study the logic, the dynamics of the system

### Use of the study and strategy

- Define a shared vision and strategic trajectory
- Mobilise members
- Develop strategic approaches



#### Exploring the future

- Analyse possible developments
- Understand the transformations that are taking place
- Anticipating challenges

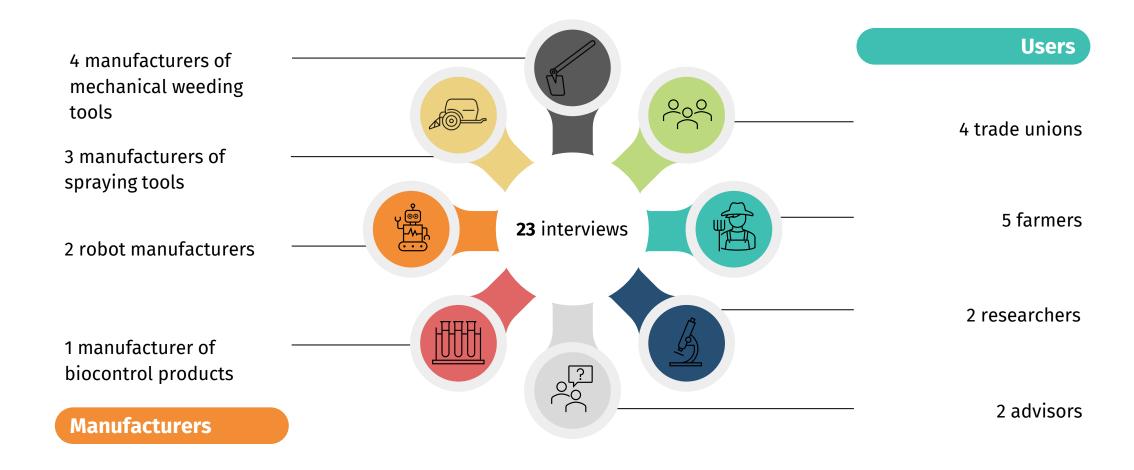
# **Expert opinion survey**

**Individual semi-directive interview** 



## **Conducting the expert opinion survey**

### **Profiles of the experts surveyed**





# **Result of the expert opinion survey**

### **Convergences**

### **Regulation**

There is an increase in the regulation of PPPs\*.



There is an increase in the number of herbicide resistant weeds.

# Bad image of herbicides

There is a growing public mistrust of chemical weed control.



# Reduction of the workforce

It is difficult to find manpower to carry out weeding (especially chemical weeding).

### **Localized spraying**

Weed control will be carried out by applying herbicides only to the areas to be sprayed.

### **Mechanical weeding**

There will be an increase in mechanical weeding in conventional agriculture.

# **Result of the expert opinion survey**

### **Convergences**

### No belief in the alternative

Electric, thermal or steam weeding... is too energy consuming for use in field crops.

# Difficulty in accessing new technologies

The adoption of new technology request significant investment and the development of new skills for farmers.



# Difficulty of doing No-Till without chemistry

It is difficult to do soil conservation agriculture without herbicides. As the soil is not worked, it becomes a favourable ground for weeds.

### The use of agronomic levers

« The key word in the future will be agronomy. »

## **Result of the expert opinion survey**

#### The differences





# Having your own equipment

Farmers want to have flexibility in the use of their tools.

# **Ability to grow crops** without herbicides

Herbicides no longer have a future because resistance is developing and there are less products available.

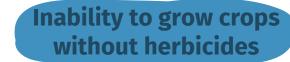


### **Sharing equipment**

Farmers want to reduce their costs and share their experiences.







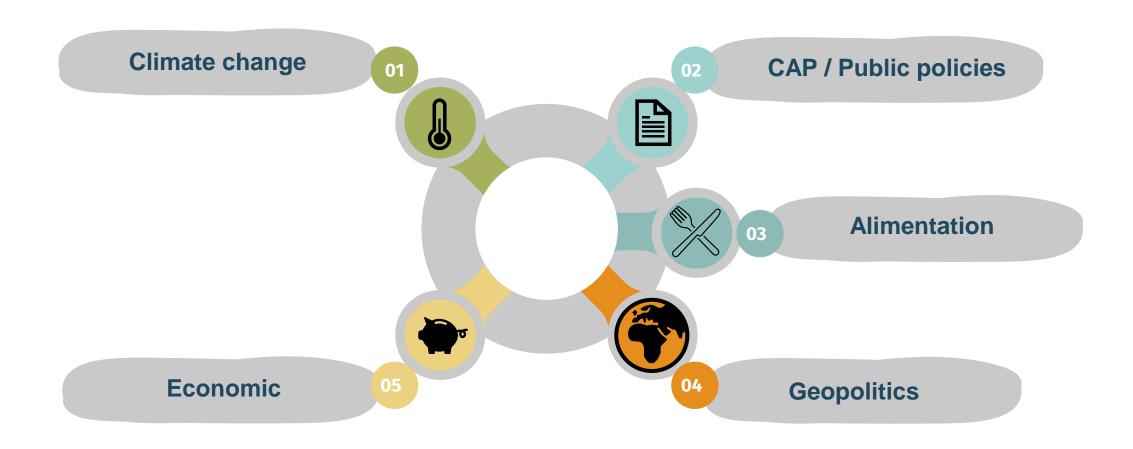
The trend is towards much more systematic use of products because herbicides are becoming less and less effective.





# Variables influencing weed control

The 5 variables that indirectly influence



# Variables influencing weed control



### The study of variables

### Each variable was studied in a structured approach

#### **Definition**

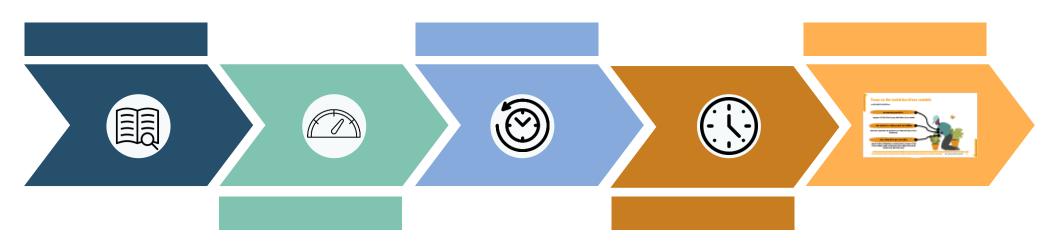
Define the variable

### Retrospective

Study of the history of the variable

### **Hypotheses of evolution**

Study of the different possible technical developments in the variable



#### **Pertinent indicators**

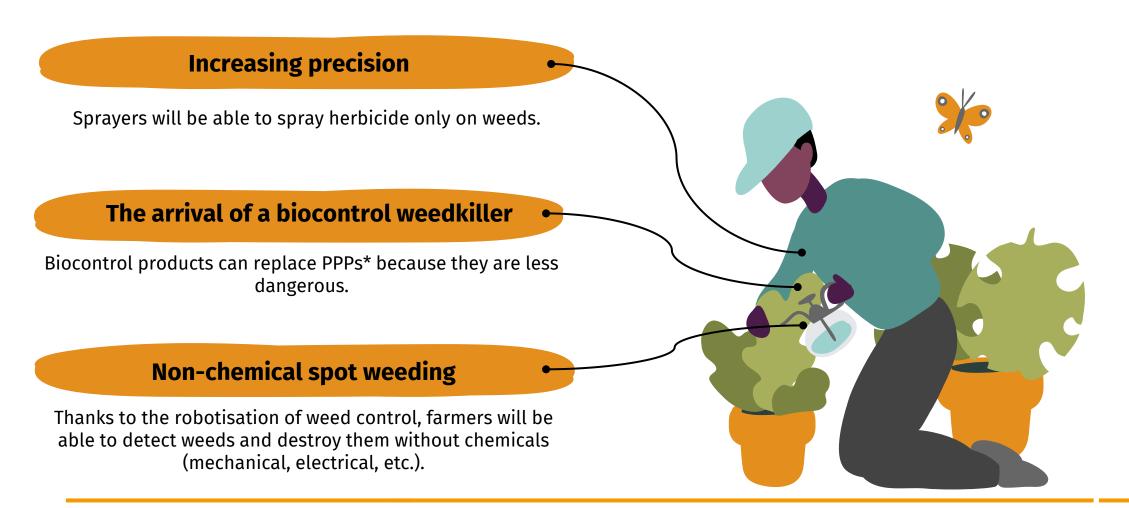
Figure to qualify the variable and its evolution

### **Dynamics of change**

study the present and the changes that are taking place

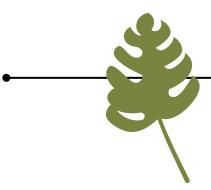
### Focus on the evolution of one variable

#### **Technical solutions**



### **Presentation of the trend scenario**

**Changes without breaks** 



Global context

slow changes

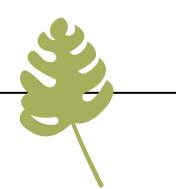
Europe is in a phase of slight economic growth with an increase in purchasing power. Climate change issues are not yet on everyone's mind.



Agricultural context

50% reduction in the use of PPPs\*

There is a desire to reduce as much as possible the use of synthetic fertilizers and phytosanitary products.

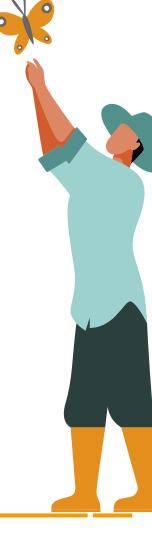


Weed control practices

Many products are prohibited

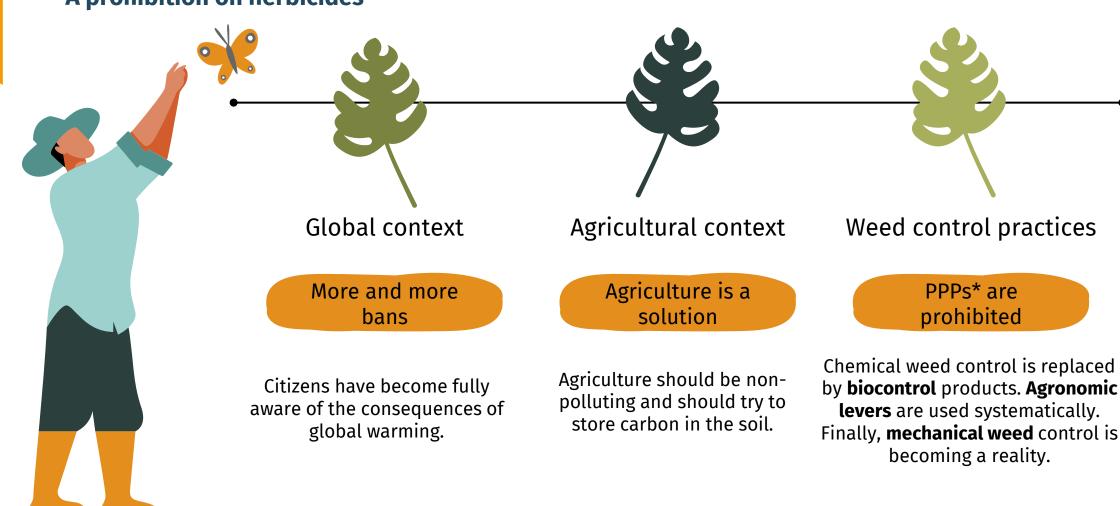
Sprayers are becoming more precise to reduce the doses used per hectare. Sprayers are more autonomous to reduce contact between users and PPPs. Mechanical weed control is developing and is being robotised to fight the weed

resistance to PPPs.



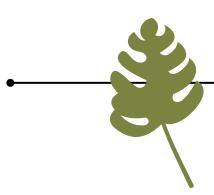
### Presentation of the breakdown scenario 1

A prohibition on herbicides



### Presentation of the breakdown scenario 2

**Global famines** 



Global context

Undernourishment is increasing

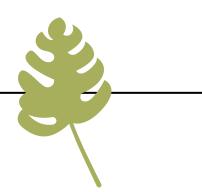
The world's population is increasing and global warming is reducing yields. Famines are on the rise around the world. Europe is mobilising in the face of this human tragedy.



Agricultural context

French yields must be preserved

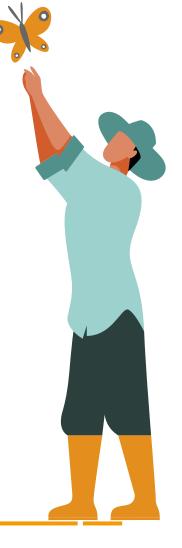
Conventional agriculture remains the dominant farming system and farm size is increasing. Farms are being absorbed by agribusinesses.



Weed control practices

The same weeding techniques.

Spraying equipment continues to improve. Mechanical weed control remains a minority for organic farming and biocontrol products are not widely used because they are too expensive.



### **Conclusion**

"What weed management techniques will be used in field crops in France by 2035?"

### The future of weed control

The future of weed control will probably pass by **localised spraying**, **mechanical weeding** and the use of **agronomy**.

### Discussion of the results

This question, which may seem **very technical** at first impression, leads us to consider **multiple interconnected variables**, mixing complex issues of **technological evolution**, **economic issues** and **social issues**.

### **Continuation of the study**

It is up to us **to write a sustainable future** for weed control.





# Thanks!

Do you have any questions?

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