French Observation Center of Digital Agriculture Adoption

Use of EGNOS in French farming

 #ObsAgroTIC

EGNOS ANNUAL WORKSHOP

ROME, ITALY
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Who are we?

Who are we?

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Who are we?

Bruno
Tisseyre

Léo
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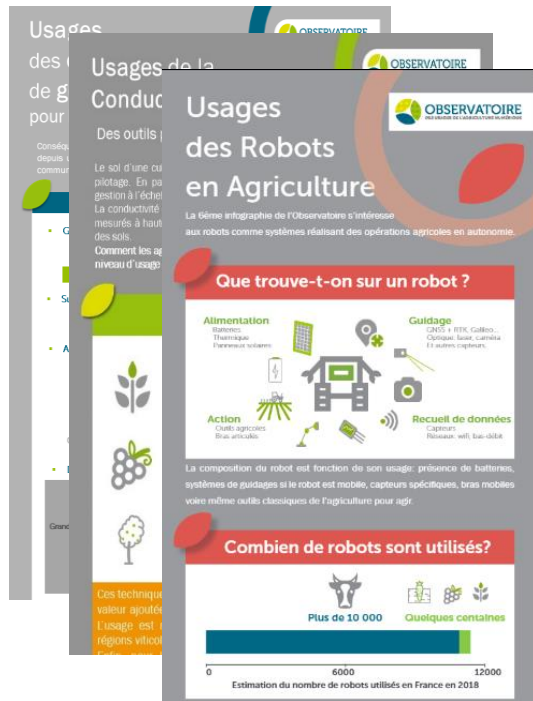Valoo

- Teaching
- Research
- Services

Who are we?

French Observation Centre of Digital Agriculture Adoption
Since 2016

To assess digital agriculture adoption in France

What do we do?
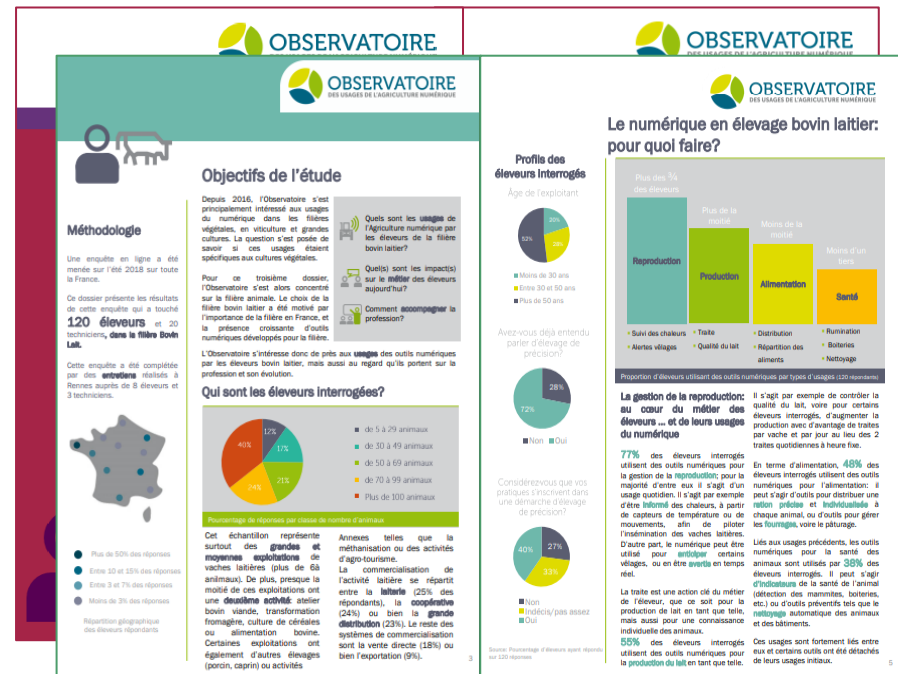
Infographics

Thematic brieves

3 per year

2 per year

https://agrotic.org/observatoire/

What do we do?

Infographics

Thematic brieves

Today :

Use of GNSS in France in 2019
Focus : EGNOS Usage

2 per year

https://agrotic.org/observatoire/

Adoption of GNSS in France

What is the level of adoption in France?

What is it used for?

Are there specificities between crops?

What are the barriers and factors to adoption?

Adoption of GNSS in France

- **Methodology**

Adoption of GNSS in France

Methodology

Littérature review

Survey and interviews

Providers and users	Equipement advisors
9 phone interviews	Quantitative survey (23 answers) + 13 interviews

Infographics
https://agrotic.org/observatoire/

Adoption of GNSS in France

- Methodology
- **What is the level of adoption?**

Adoption of GNSS in France

■ **RTK, EGNOS, SF1** and **RTX** are the most frequently cited

Do you have examples of GNSS used by the farmers you advise?

*15 respondents

Adoption of GNSS in France

- **RTK, EGNOS, SF1** and **RTX** are the most frequently cited

- **Less than a half** of French farmers use GNSS on their equipment, according to most of the responding advisors.

What proportion of farmers you advise use GNSS on their tractor?*
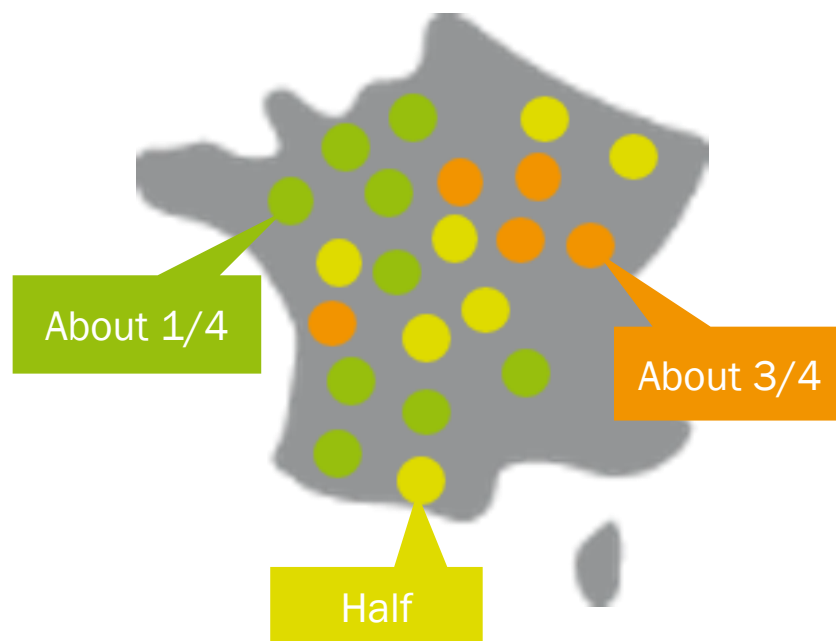

About 1/4

About 3/4

Half

*15 respondents

Adoption of GNSS in France

- **RTK, EGNOS, SF1** and **RTX** are the most frequently cited

- **Less than a half** of French farmers use GNSS on their equipment, according to most of the responding advisors.

- **80%** of farmers who buy equipment are equipped with GNSS (at least dGNSS) according to machine suppliers

Trends in the distribution of the technology used, according to French suppliers
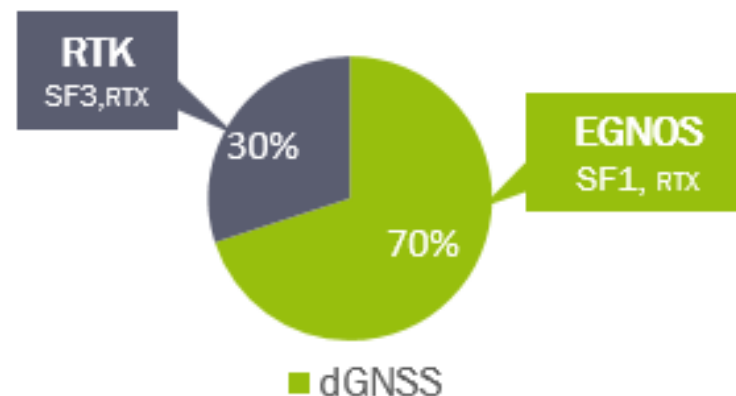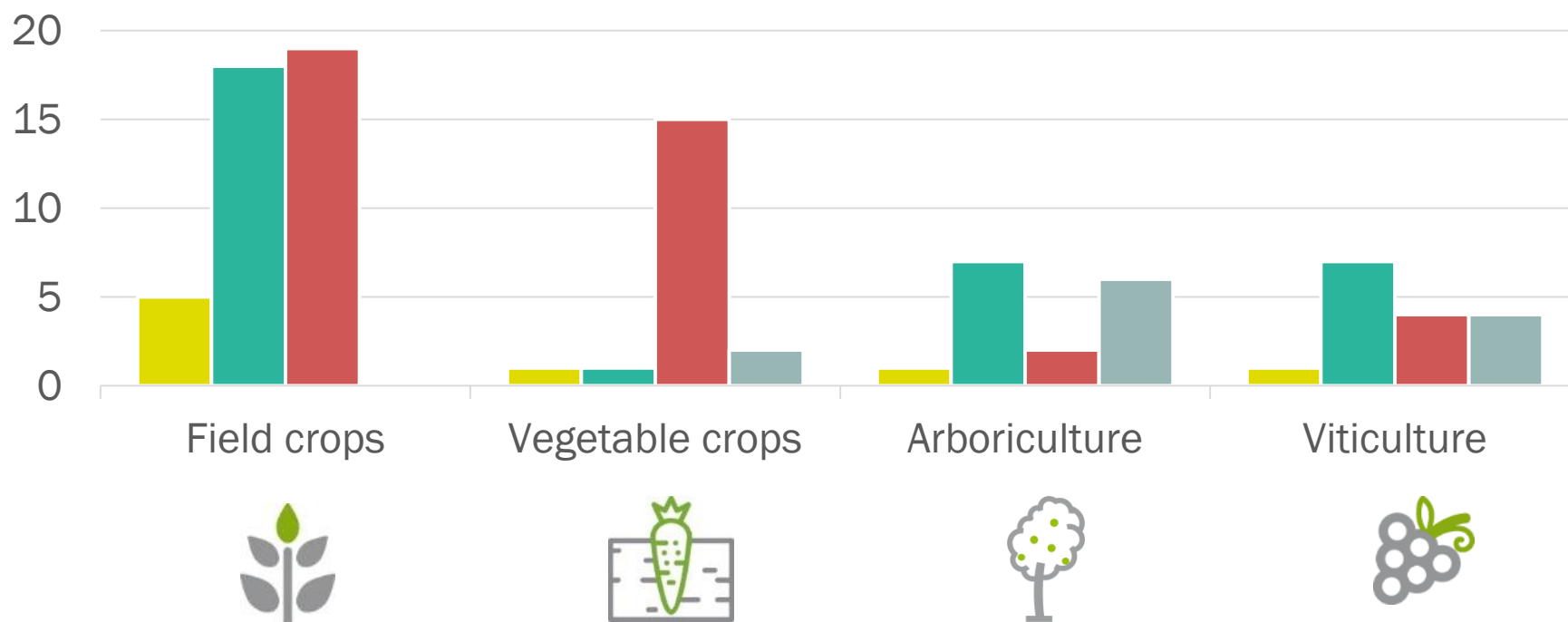
Adoption of GNSS in France

- Methodology
- What is the level of adoption?
- **What GNSS is used for?**

Use of GNSS in France

According to your observations, do farmers use GNSS in the following sectors?*

Legend: Natural (m) · dGNSS (EGNOS) · RTK and equivalent (cm) · Not at all

19/09/2019
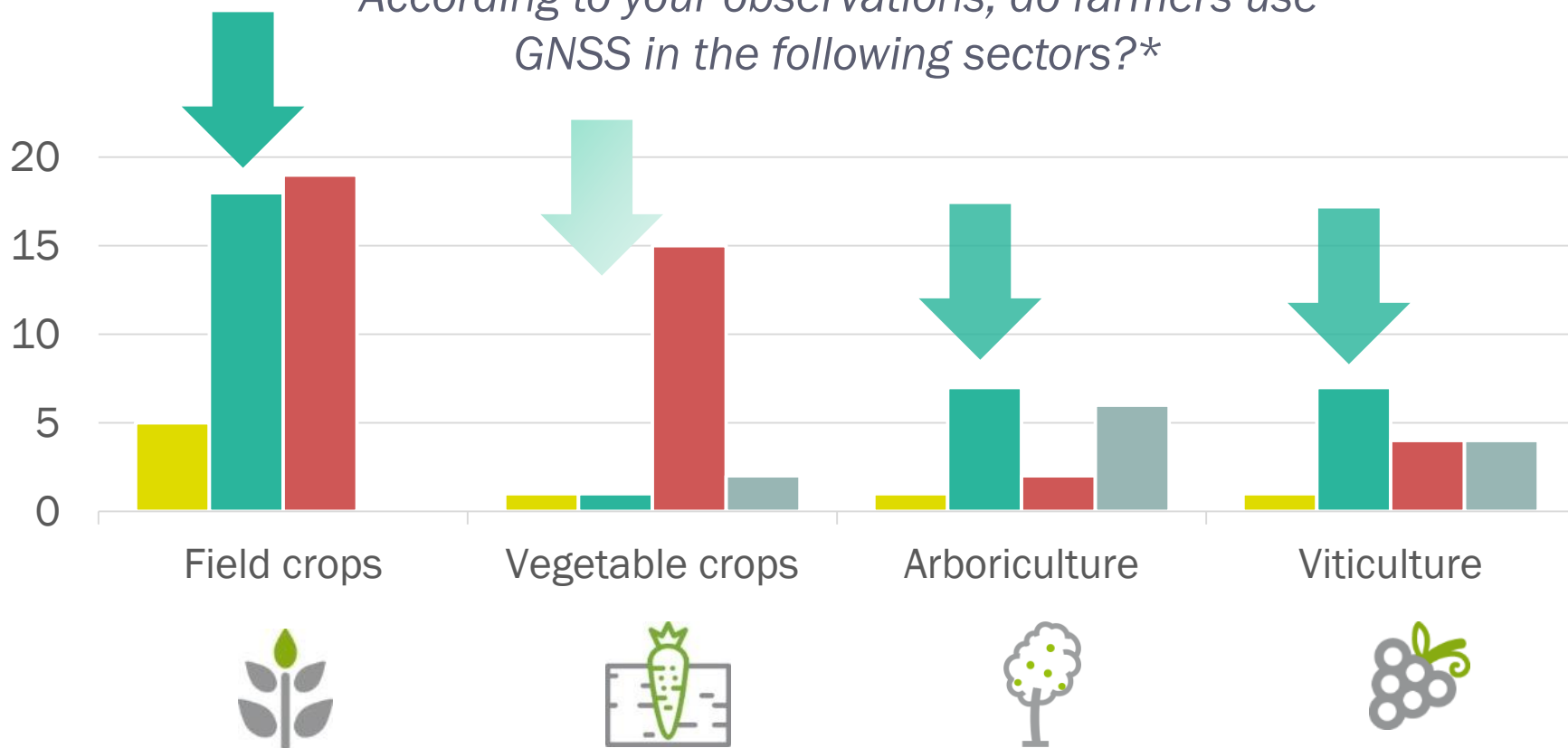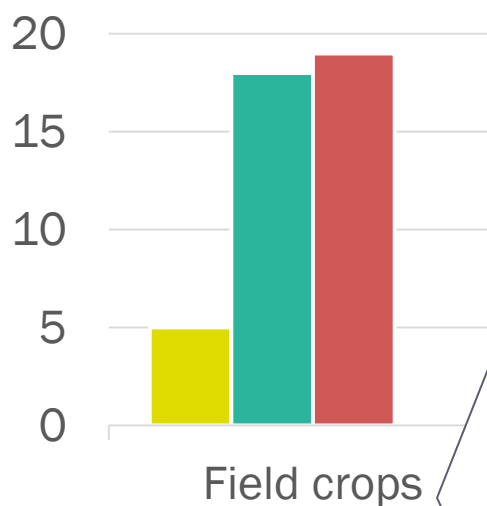
*23 Respondents 16

Use of GNSS in France

*According to your observations, do farmers use GNSS in the following sectors?**

Legend: Natural (m), dGNSS (EGNOS), RTK and equivalent (cm), Not at all

Categories: Field crops, Vegetable crops, Arboriculture, Viticulture

Use of GNSS in France

A common use
Every level of correction *

>10cm: guidance, section control, Variable Rate application
- Spraying, Fertilisation, Soil tillage, Harvesting

~1cm: autoguidance
- **Seeding, Weeding,** Ridging

Chart (Field crops):
- Natural (m): ~5
- dGNSS (EGNOS): ~18
- RTK and equivalent (cm): ~19

Y-axis: 0, 5, 10, 15, 20

Field crops

■ Natural (m)   ■ dGNSS (EGNOS)   ■ RTK and equivalent (cm)   ■ Not at all

Use of GNSS in France

A common use
Every level of correction *

>10cm: guidance, section control, Variable Rate application
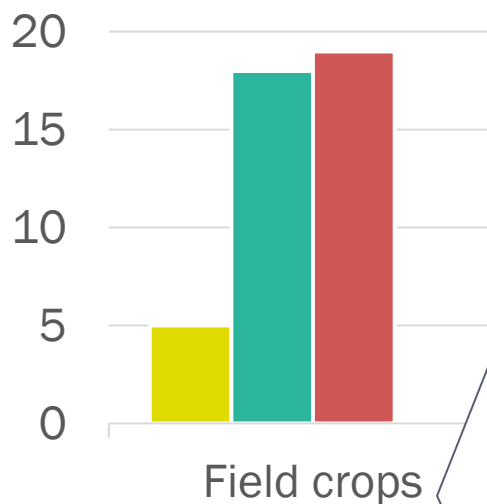- Spraying, Fertilisation, Soil tillage, Harvesting

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Field crops

■ Natural (m)   ■ dGNSS (EGNOS)   ■ RTK and equivalent (cm)   ■ Not at all

* Pass to pass accuracy

Use of GNSS in France

According to your observations, do farmers use GNSS in the following sectors?*

Limited uses –
Large farms
Very high precision *

~1cm: autoguidance
- **Seeding, planting**
- **Mechanical weeding**
- Ridging
- Harvesting

Field crops   Vegetable crops

■ Natural (m)   ■ dGNSS (EGNOS)   ■ RTK and equivalent (cm)   ■ Not at all

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Use of GNSS in France

According to your observations, do farmers use GNSS in the following sectors?*

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- Harvesting

Vegetable crops

■ Natural (m)   ■ dGNSS (EGNOS)   ■ RTK and equivalent (cm)   ■ Not at all

Pictures : https://www.agrireseau.net/petitsfruits/blogue/93952?sort=5
* Pass to pass accuracy

Use of GNSS in France

Perennial crops
Very low adoption *
Work management and planting

>10cm : traceability, spraying, fertilisation, measurement

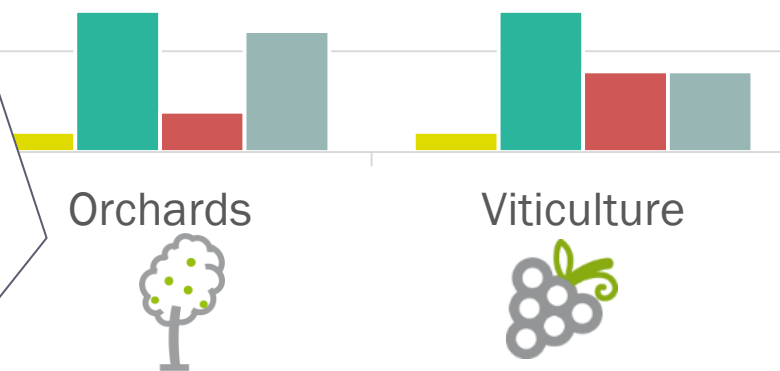~1cm: planting, weeding (robotics)

Groupe Castel, Bordeaux, Source Réussir Vigne

Sources : Lonardi, Casella

Orchards

Viticulture

■ Natural (m)   ■ dGNSS (EGNOS)   ■ RTK and equivalent (cm)   ■ Not at all

19/09/2019

* Pass to pass accuracy

Use of GNSS in France

And transversal uses...

- Measurements
- Connected boxes
- For collectif devices (Service providers, cooperatives)
  - Guidance, VRT...
  - Tracking
  - Invoicing ...

Adoption of GNSS in France

- Methodology
- What is the level of adoption?
- What is GNSS used for?
- **What are the barries and factors to adoption?**

Use of GNSS - adoption drivers

Working comfort
Time saving

Tiredness
Night work
Facilitate work
Reduce the risk of errors

Agronomics

Precision
Repeatability
Work quality
Optimize efficiency

Economic and environmental interest

Input savings
Material management
Maintenance
Invoicing

Use of GNSS – adoption barriers

Costs

Equipment, tools, subscriptions
theft

Technical

Signal reliability
Complexity
Installation time
Dependency on manufacturers

Knowledge of the supply

Diversity
Communication
Distribution of
competences

Adoption of GNSS in France

- Methodology
- What is the level of adoption?
- What is GNSS used for?
- What are the barries and factors to adoption?
- **Conclusion**

Conclusion

- Difficulties for suppliers and advisors to know user needs
    - A need to assess the adoption
    - A need to make partnership

Conclusion

- Difficulties for suppliers and advisors to know user needs
  - A need to assess the adoption
  - A need to make partnership

- Difficulties for farmers to know the offer and the technical characteristics

Does the GNSS service offer seem clear to you?

Not at all   Absolutely clear

Conclusion

- Difficulties for suppliers and advisors to know user needs
    - A need to assess the adoption
    - A need to make partnership

- Difficulties for farmers to know the offer and the technical characteristics
    - A need of awareness, training, support and after-sale services
    - A need of neutral repositories
    - A need of transfer information from research to education, business, equipment suppliers, farmers and advisors

L'Observatoire des Usages

Thank you

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UMR ITAP

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ANNEXES

Adoption of GNSS in France

Système de positionnement GPS

Êtes-vous équipé d'un système de positionnement GPS sur votre exploitation ?

1. Non cela n'est pas utile (568 votes)

   38,1 %

2. Oui DGPS (plus ou moins 20 cm) (492 votes)

   33 %

3. Non mais j'envisage d'investir (218 votes)

   14,6 %

4. Oui RTK (plus ou moins 2 cm) (214 votes)

   14,3 %

Total des votes : 1492

Autres sondages

- **47 % farmers are equiped with** GNSS on their farm
- **2 kinds** of GNSS are used: DGPS, RTK

Use of GNSS in France

Fields crops and industrial crops

Cereals, seeds, beets, potatoes, organic farming, …

>10cm

- Spraying
- Fertilisation
- Soil tillage
- Harvesting

A common use
Every level
of correction

Guidance
Section control
Variable rate application

Use of GNSS in France

Fields crops and industrial crops

Cereals, seeds, beets, potatoes, organic farming, ...

A common
use
Every level
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>10cm
- Spraying
- Fertilisation
- Soil tillage
- Harvesting

~1cm
- Seeding
- Weeding
- Ridging

Guidance
Section control
Variable rate application
Autoguidance

Use of GNSS in France

![Plant icon] **Fields crops and industrial crops**
Cereals, seeds, beets, potatoes, organic farming, ...

**A common use
Every level
of correction**

>10cm
- Spraying
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~1cm
- Seeding
- Weeding
- Ridging

Guidance
Section control
Variable rate application
Autoguidance

Some additional messages

- Equipment is often underused
- RTK: fewer and fewer farmers have their own antenna
- Little us of yield mapping

Use of GNSS in France

Vegetable crops

>10cm

- Seeding, planting
- Mechanical weeding
- Ridging
- Harvesting

Limited uses
Large farms
Very high
precision

Some additional messages

- Very low speed : relative accuracy
- Repetability
- Often proprietary RTK antennas
- Robotics

Use of GNSS in France

Perennial crops

Viticulture and arboriculture to a lesser extent

Very low adoption Work management Planting

>10cm

- **Traceability**
- Sraying
- Fertilisation
- Measurement

~1cm

- **Planting**
- Weeding

Some additional messages

- Unsuitable field
- Night work (viticulture)
- Experiments