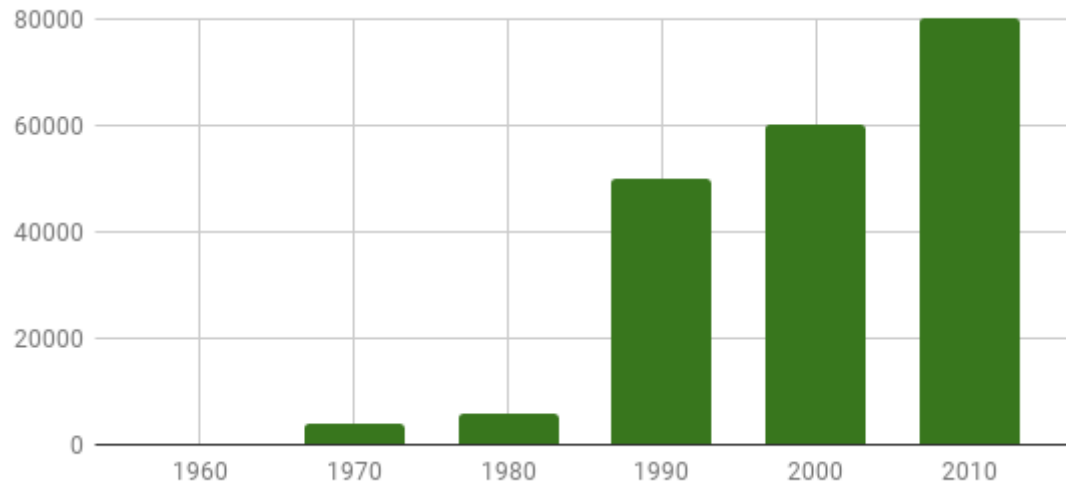


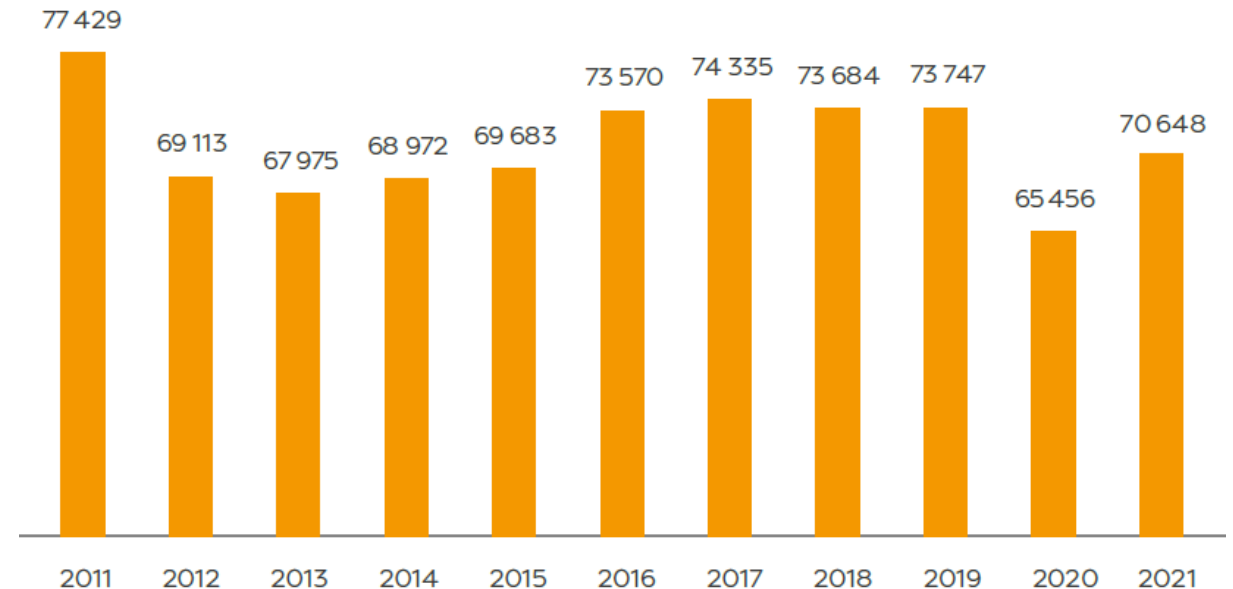
➤ Goat insemination programs based on the male effect using less or no hormones are progressing with suitable fertility results

## ➤ Key features of goat insemination in France



- Steady progression from 1950's until 2010
- **2010 peaked at 82 160 AI performed (about 10% of total goat population)**
- Technical developments = cervical AI trough speculum, hormonal treatment, semen freezing, photoperiodic treatment

- Number of AI dropped in 2012 due to surge in feed costs and decrease in milk price
- Then +/- plateaued till today
- **2022 = 63 367 AI performed in 800 herds (about 7% total goat population)**



## ➤ Key features of goat insemination in France

- AI almost exclusively performed after Hormonal Synchronization Program since 1970's
- Pressing need to develop alternative methods since 1996 (Directives 96/22/EC and 2003/74/EC prohibiting the use of certain substances having a hormonal action)

*Piacère, EAAP 2004 ; Fatet, EAAP 2008*

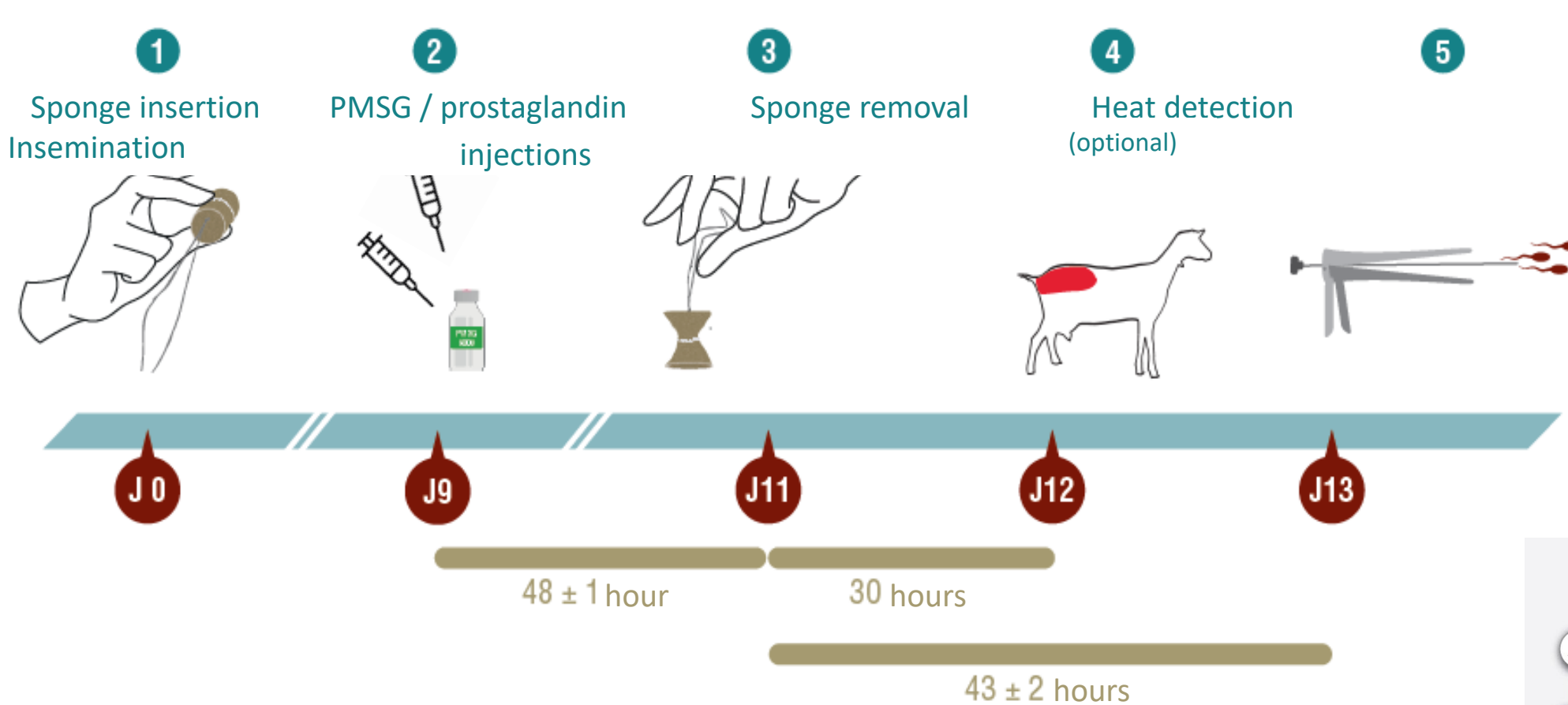
➔ Many research programs were led on :

- Photoperiodic treatments
- Buck effect
- Heat detection

➔ to offer new solutions

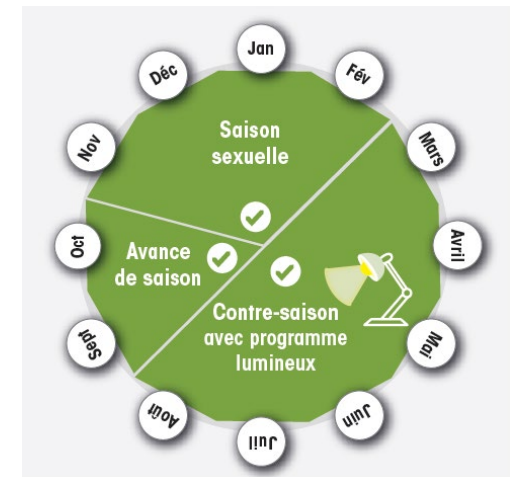


# ➤ Historical Method = Hormonal Synchronization Program (HSP)



😊  
AI at Fixed time  
Easily planned  
Year round

😞  
Numerous  
individual  
manipulation  
3 hormones incl.  
PMSG (!)

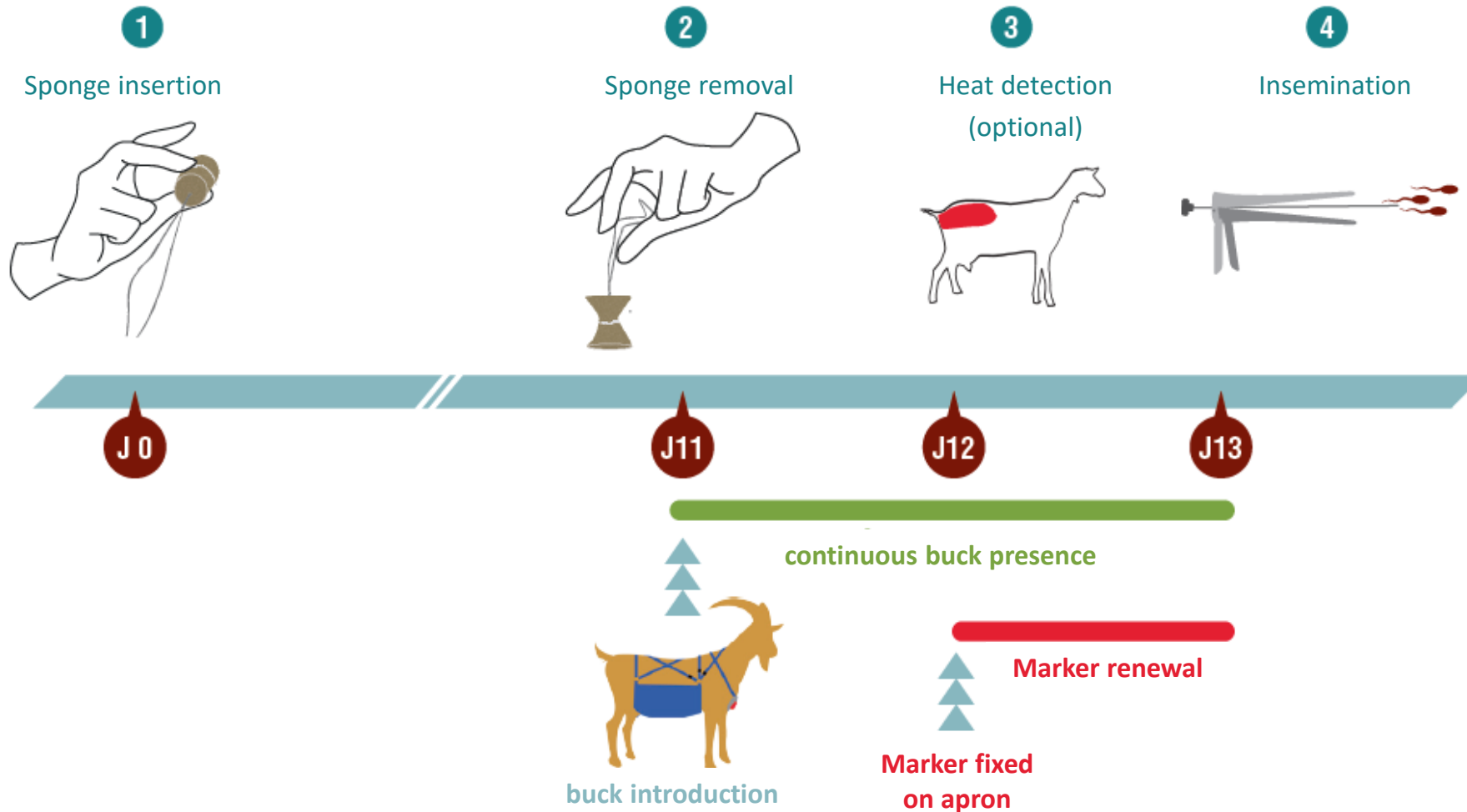


INRAE

Goat insemination programs based on the male effect using less or no hormones are progressing with suitable fertility results

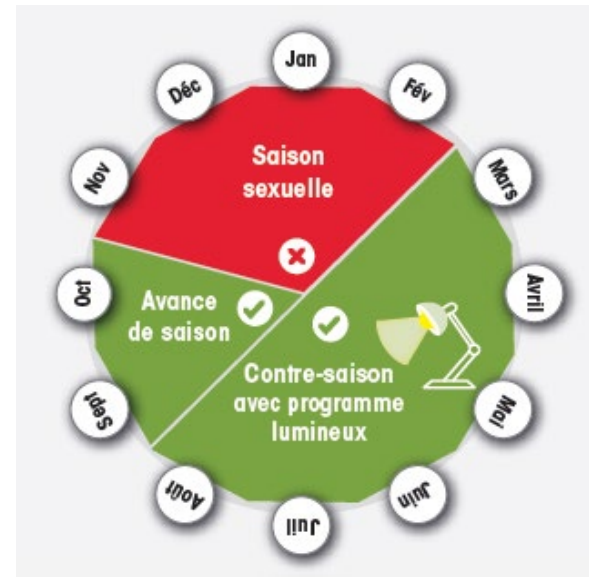
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# ➤ Preparation program with less hormones (PMSG) Vaginal sponge + Buck Effect Program (SpBE)

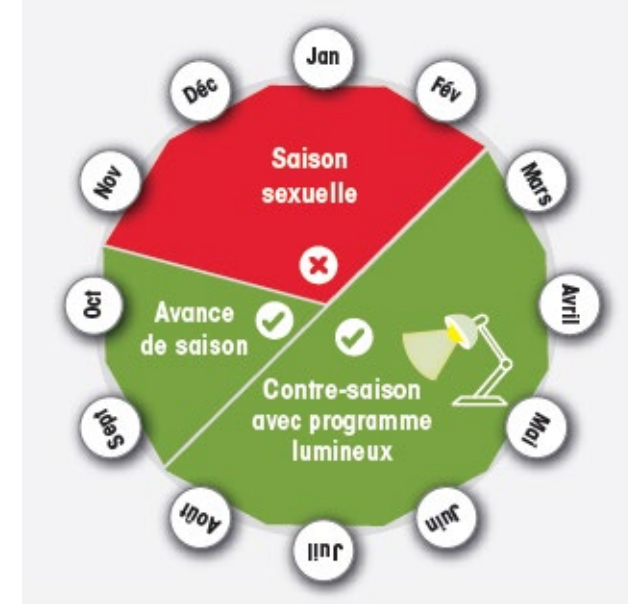
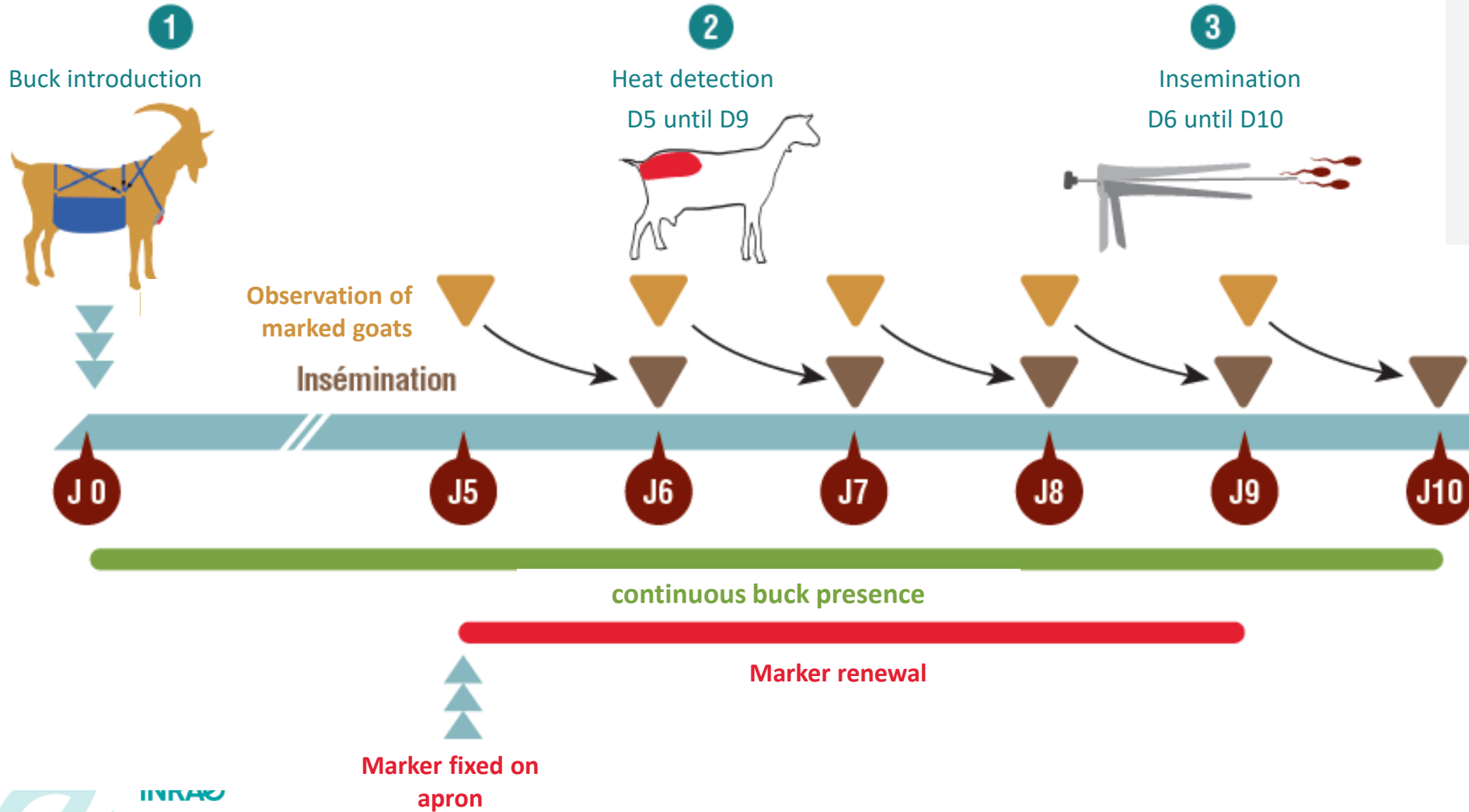


😊  
AI at Fixed time  
Easily planned  
No injections

😞  
Still a vaginal sponge  
Not during sexual season  
Photoperiodic treatment in the off-season



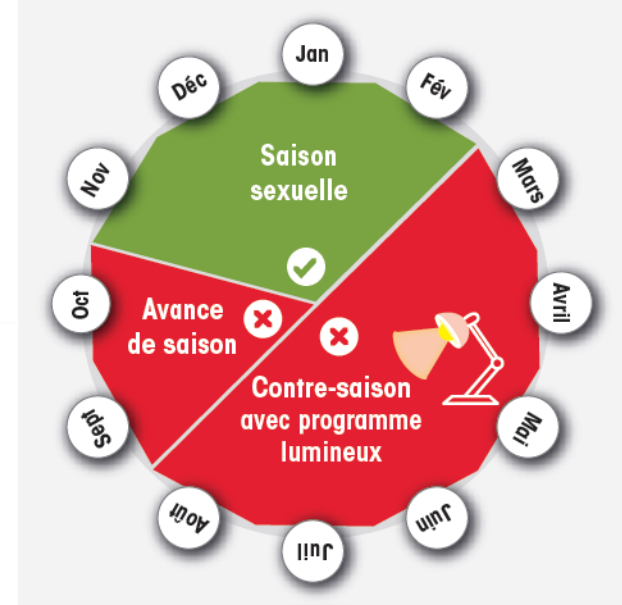
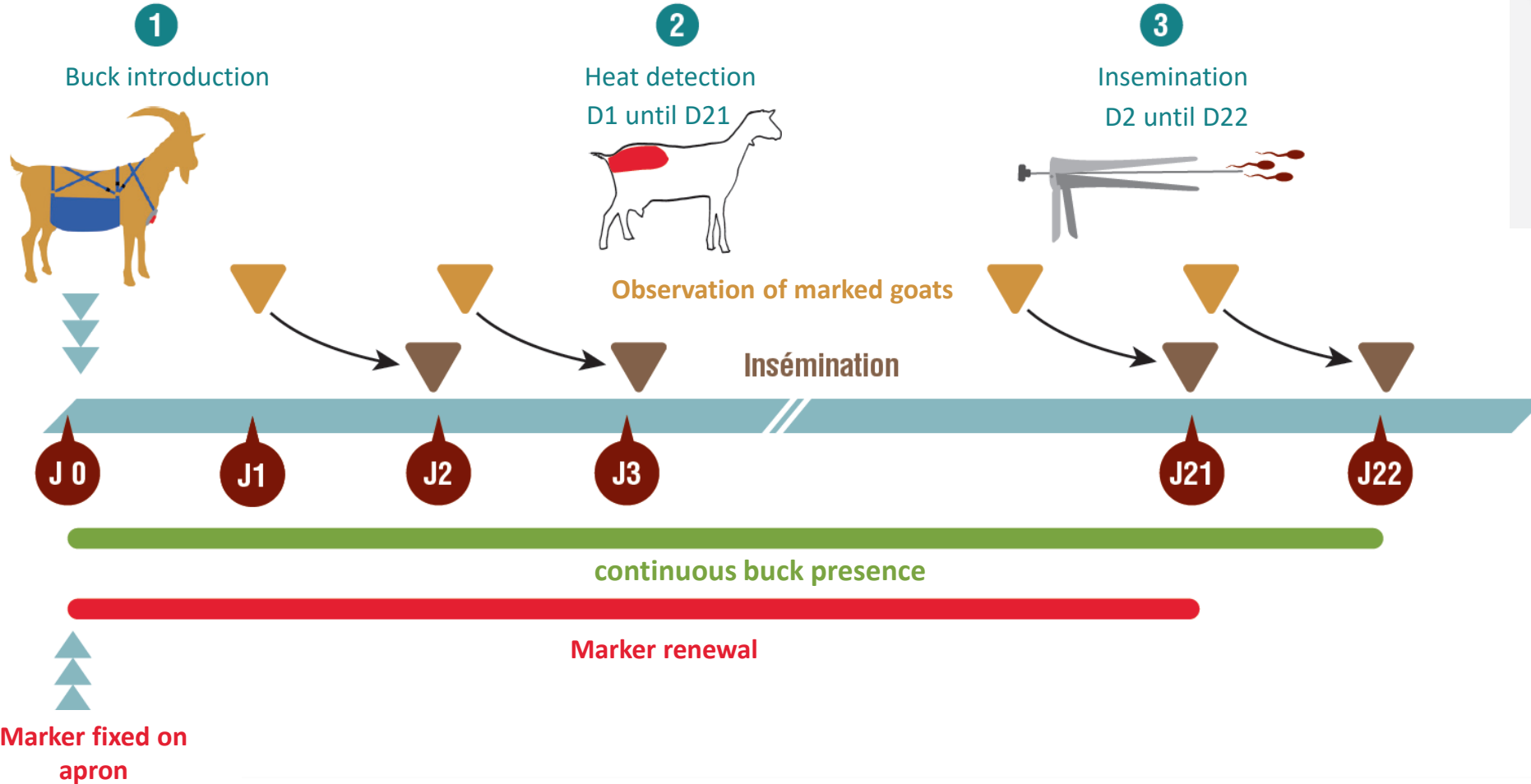
# ➤ Hormone-free preparation program before AI Buck Effect Program (BE)



😊  
No hormones (available to organic farmers)  
Grouping = AI over a 5d period

☹️  
Not in sexual season  
Photoperiodic treatment in the off-season  
Workload ?

# ➤ Hormone-free method before AI Natural Heats (NH)



No hormones (available to organic)



Only during sexual season

No grouping

AI spread over a month

Workload ?



➤ National AI records include information on the type of preparation of goats before breeding

- Technicians can record the « reproduction mode » :

- Photoperiodic treatment

*Possibly used in combination with :*

- Hormonal synchronization
- Vaginal sponge + Buck Effect
- Buck Effect / Natural Heats = often confused in the DataBase

- Sometimes not specified (about 10% of total AI)



## ➤ Adoption rate of the different solutions at the national level in 2021-2022

National database (April 2021 – September 2022)

+ data from AI cooperatives (Innoval, Auriva, 2021)

Method	National level		North-West	South-West	South-East
	Nb AI	Adoption %	%	%	%
Hormonal Synch.	101 276	93%	88%	95%	84%
Sponge – Buck Effect	2 804	3%	4%	0%	0%
Buck Effect	4 574	4% (incl. NH)	8%	5%	16%

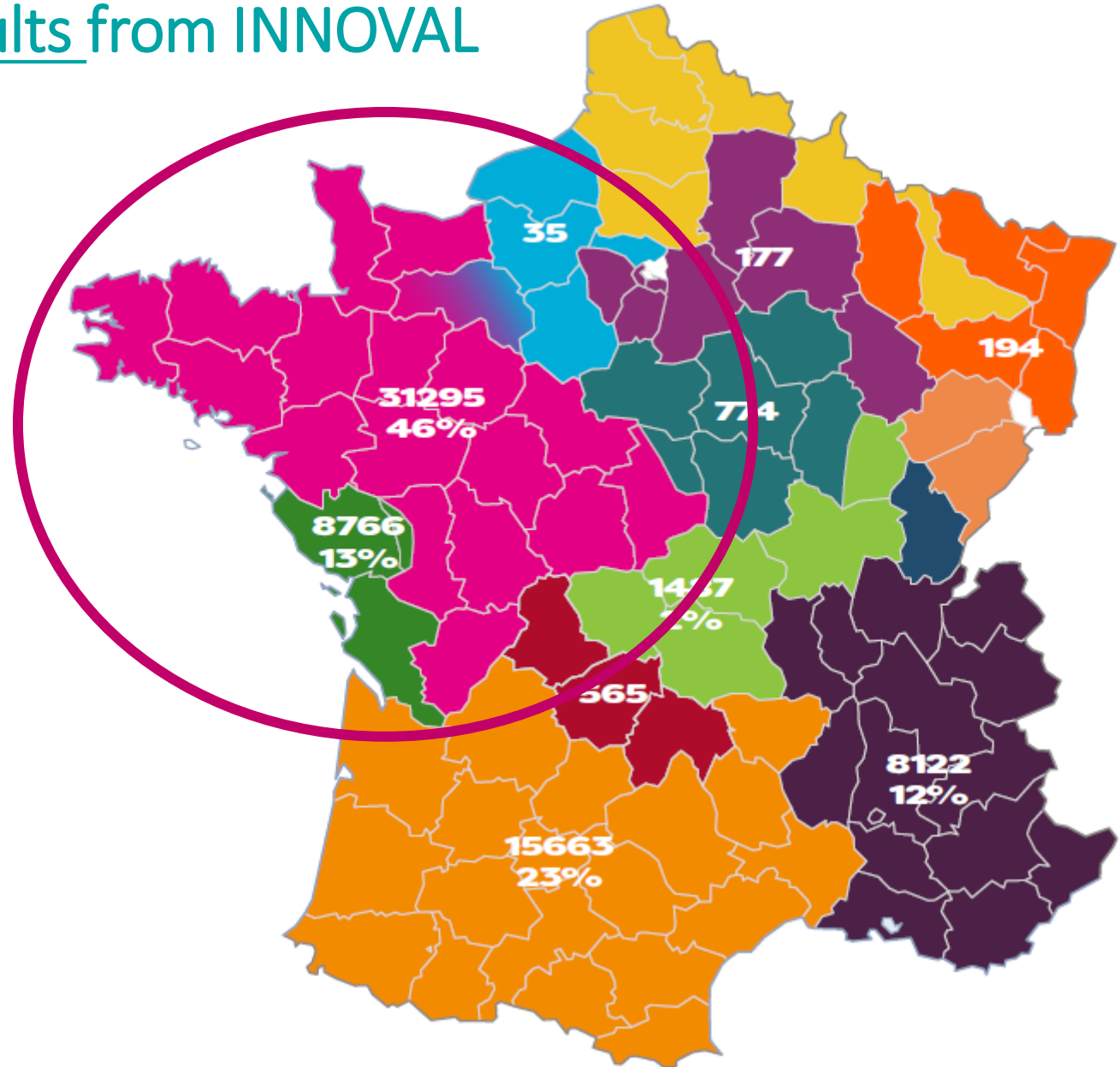
Alternative solutions are probably underestimated in the national database due to low accuracy of recorded information

At the national level, adoption seems a bit hesitant but there are regional disparities



➤ Focus on regional AI results from INNOVAL

**AI activity in 2022  
= 46% of goat inseminations  
performed in France**



## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years

■ HSP ■ SpBE ■ BE ■ NH

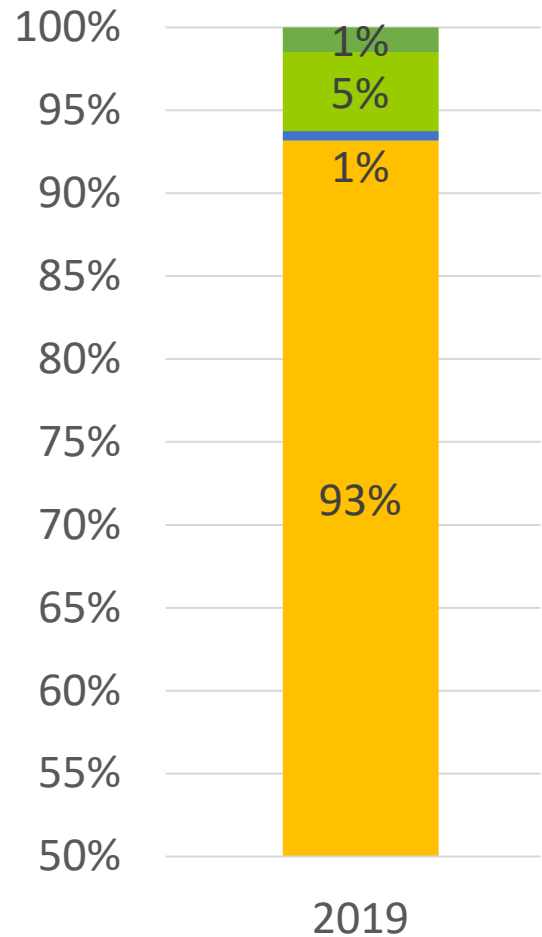


**INRAE**

Goat insemination programs based on the male effect using less or no hormones are progressing with suitable fertility results  
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*Source : Innoval, 2023*

## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years



- Representative of the national results

■ HSP ■ SpBE ■ BE ■ NH

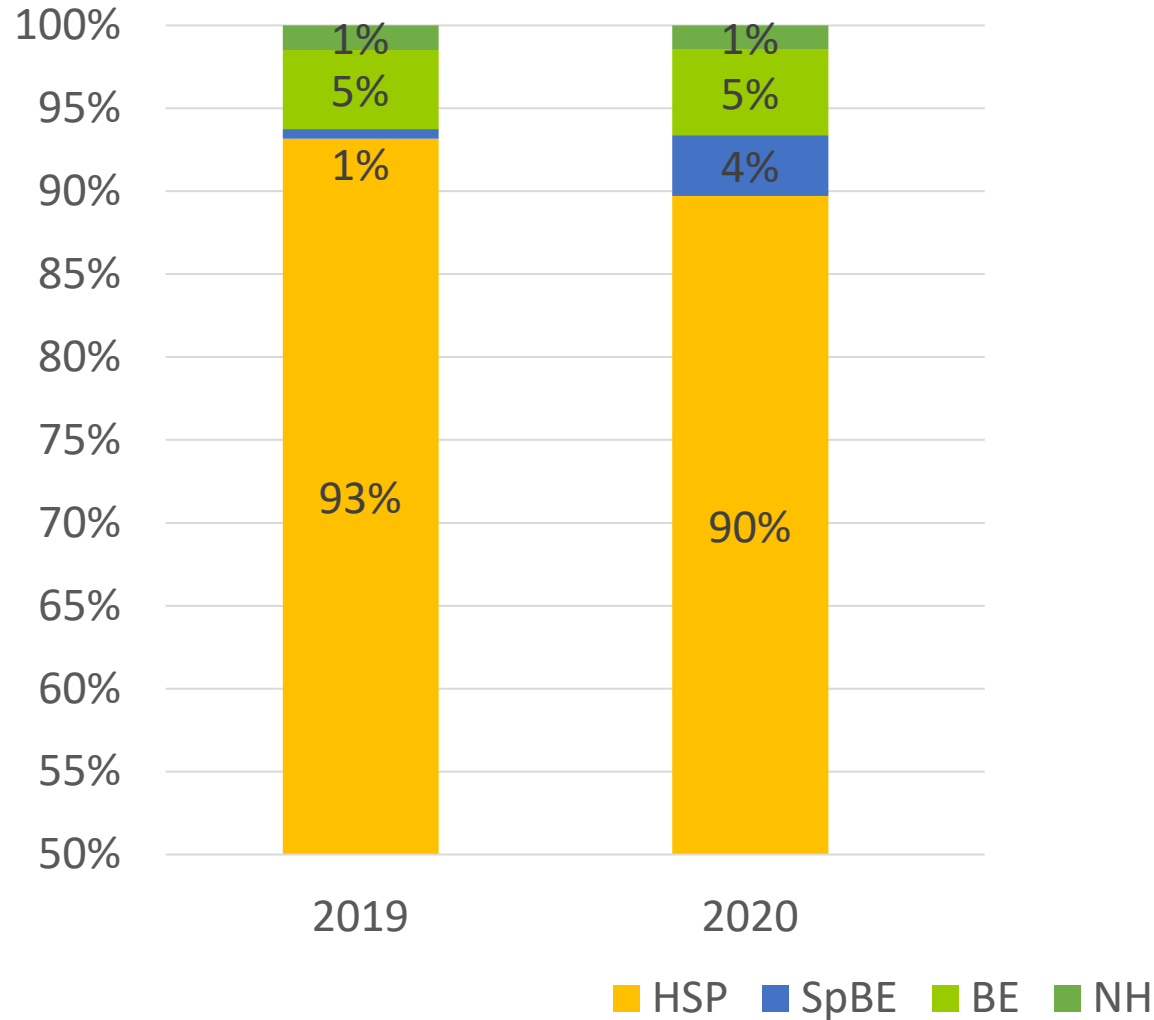


**INRAE**

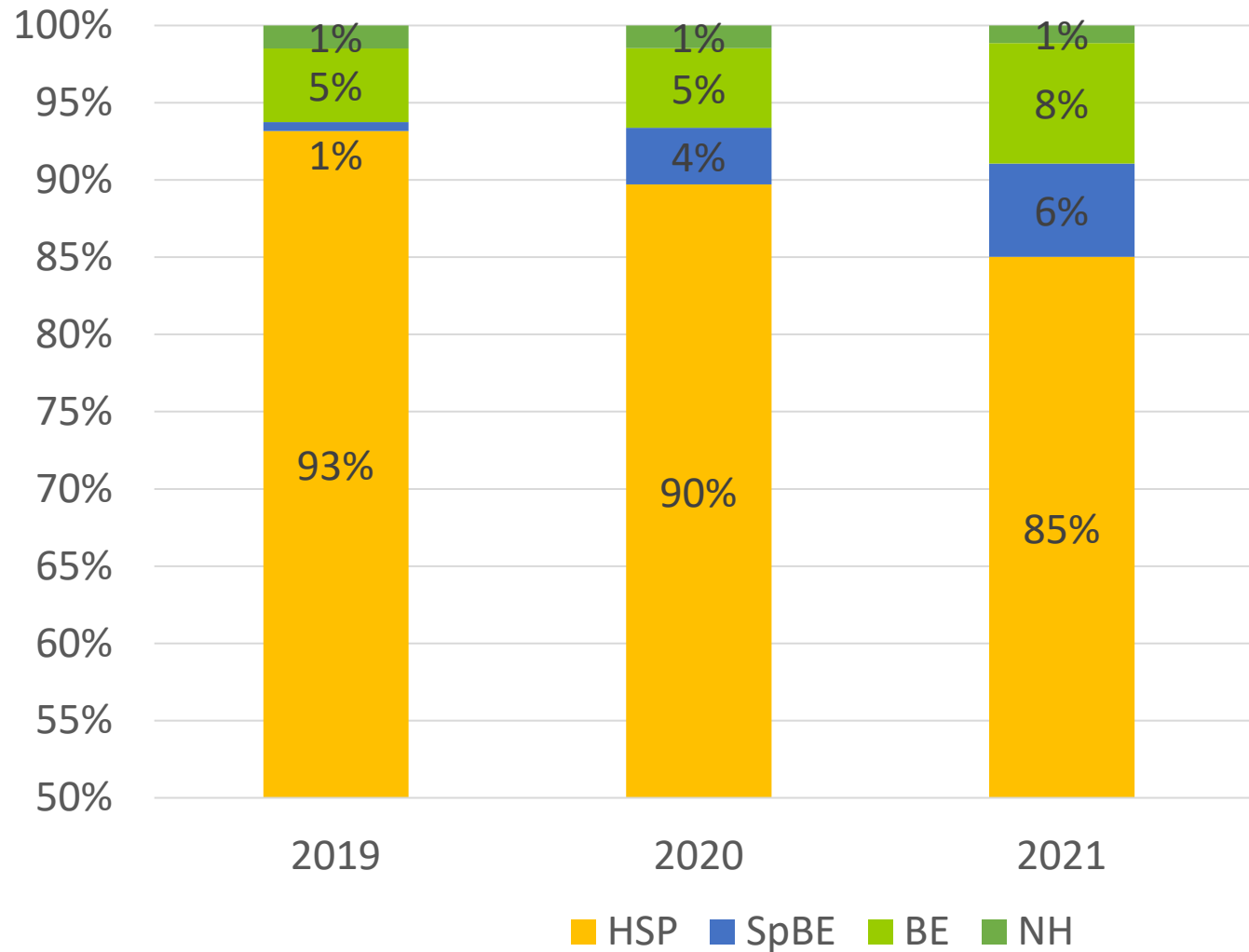
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*Source : Innoval, 2023*

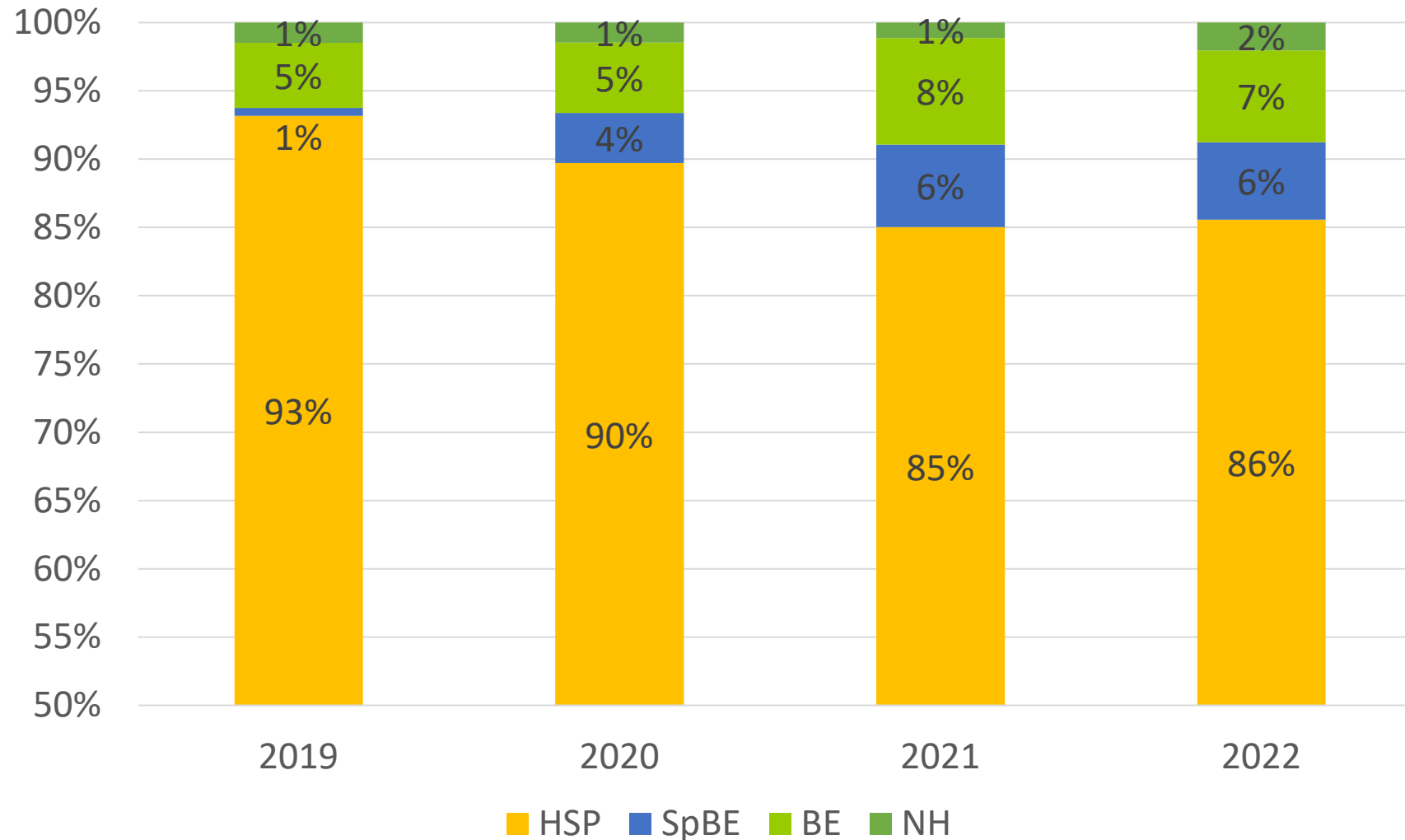
## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years



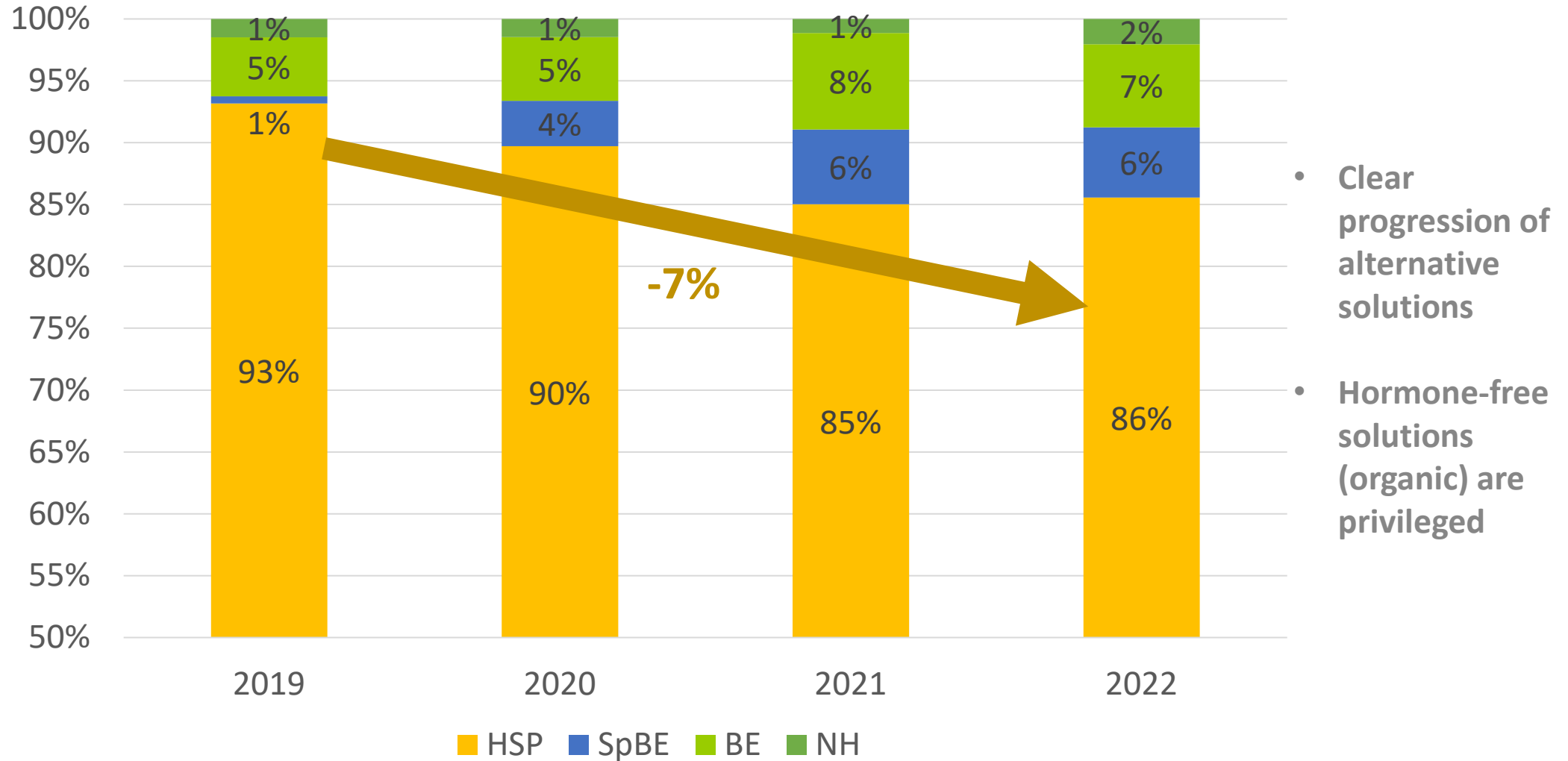
## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years



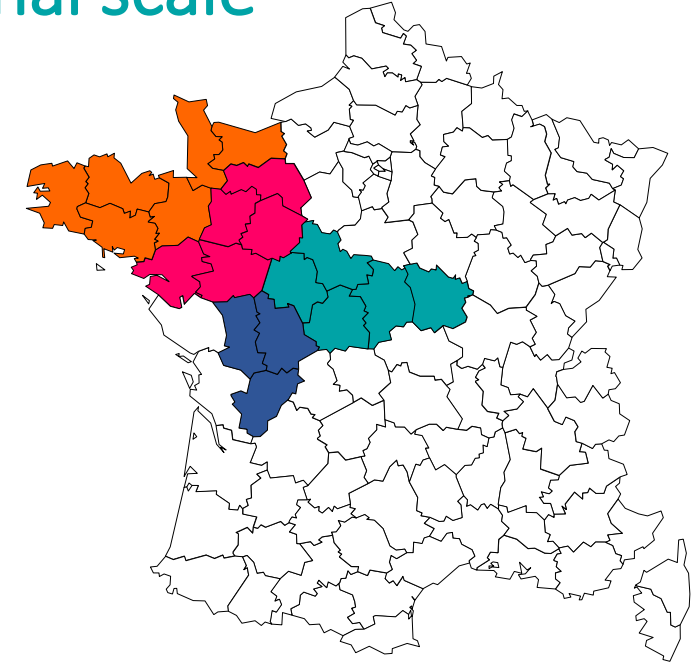
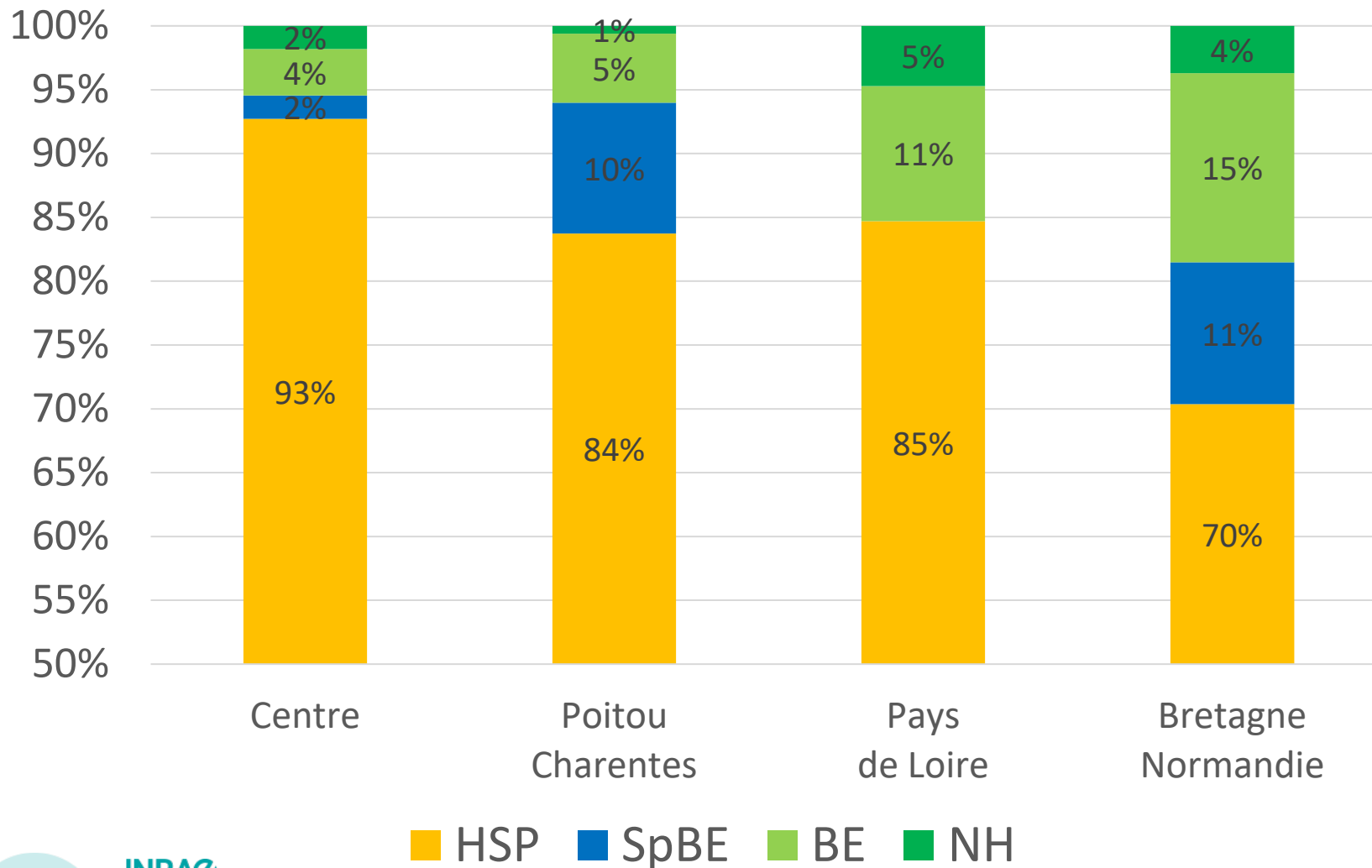
## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years



## ➤ Evolution of the use of the different preparation programs before AI over the past 4 years



## ➤ Adoption of the different methods at a Sub-Regional scale



- Solutions adopted very differently between regions
- Farmers' choices depend on :
  - size of the herd
  - type of production : milk or cheese
  - Close contact with consumers ?...



## ➤ Fertility depending on the method (23 farms / 2020-2022)

National fertility level after Hormonal Synchronization= 57-58% (2021-2022)

	Nb farms	Nb AI	Mean fertility (% kidding)	Fertility % when respecting recommendations	Fertility % when not respecting rec.
Sponge – Buck Effect	18	1 650	<b>59%</b>	<b>62%</b> (n=1506)	<b>31%</b> (n=144)
Buck Effect	5	891	<b>57%</b>	<b>62%</b> (n=626)	<b>44%</b> (n=250)

- Fertility results are equivalent to HSP
- Recommendations guarantee a good fertility level

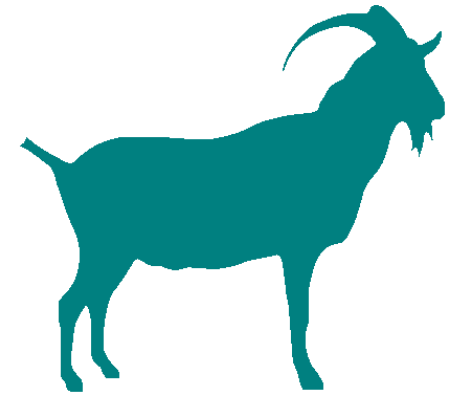


## ➤ Buck Effect and Sponge-Buck effect on-farm results

- Fertility tends to improve over the years
- // Better implementation of buck effect

### Keys to success = BUCKS !!!

- Sufficient number
- Within female pen
- Well prepared (food, lighting treatment, sexual “awakening” before BE...)



### Also HEAT DETECTION

→ correctly using males, interval between detection and AI



# ➤ Groupe Reproduction Caprine – National workgroup

Field and Science experts led by IDELE

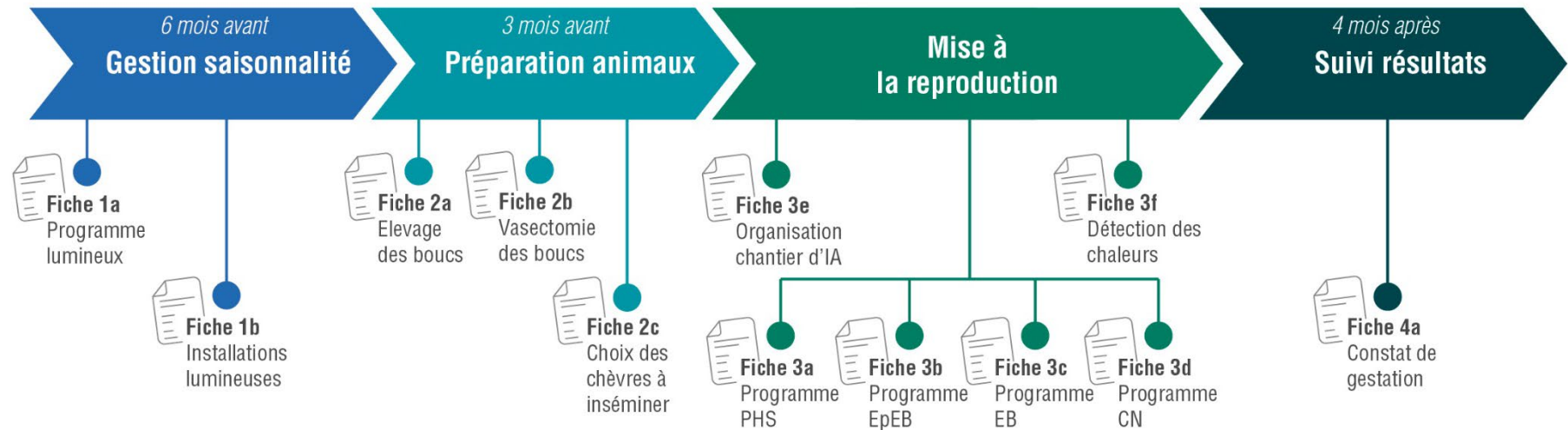
- ➔ Establish and update good practice of reproduction (incl. AI)
- ➔ Major communication efforts in favor of less or hormone-free solutions in the past years

Online resources : [www.idele/grc.fr](http://www.idele/grc.fr)

Generic e-mail to question the group : [grc@idele.fr](mailto:grc@idele.fr)

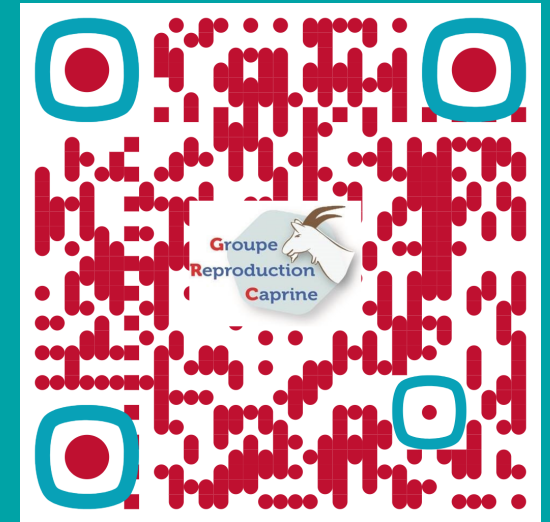


## 10 updated technical cards available online :



Programs based on the male effect using less or no hormones are progressing with suitable fertility results

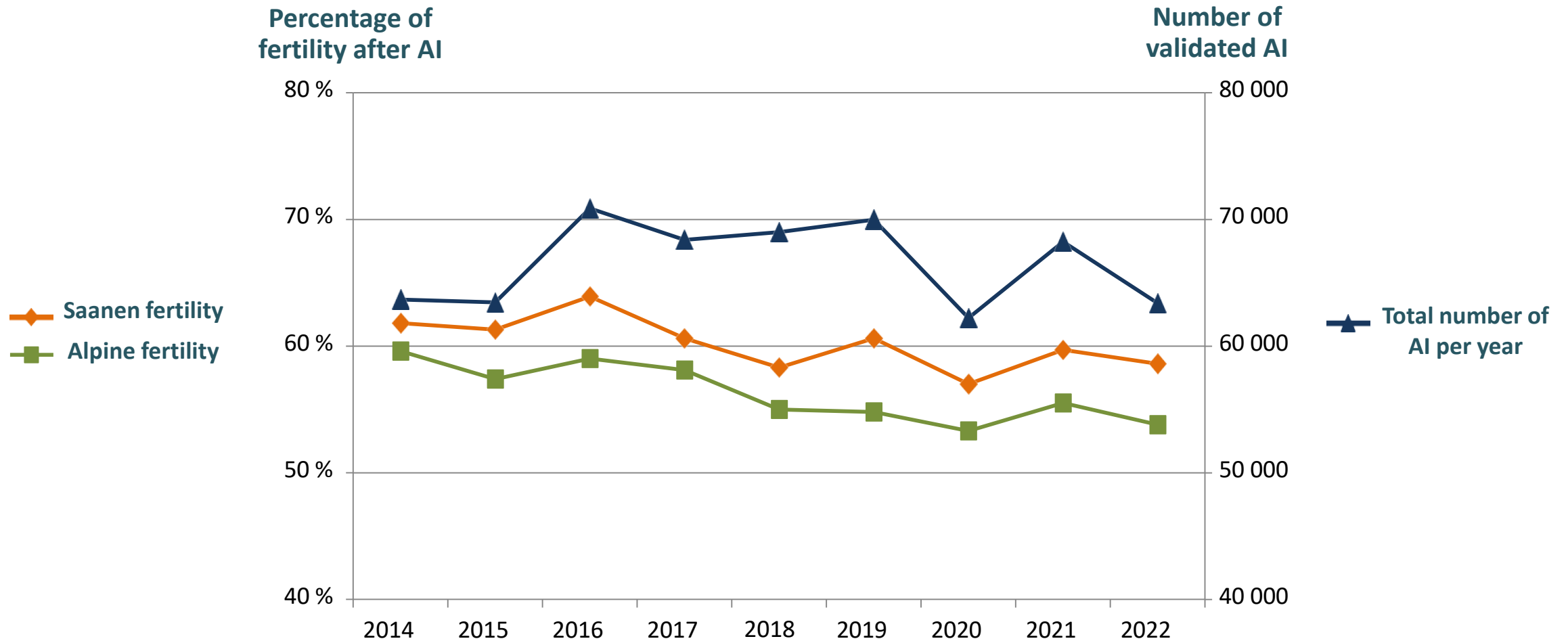
INRAE



➤ Thank you !

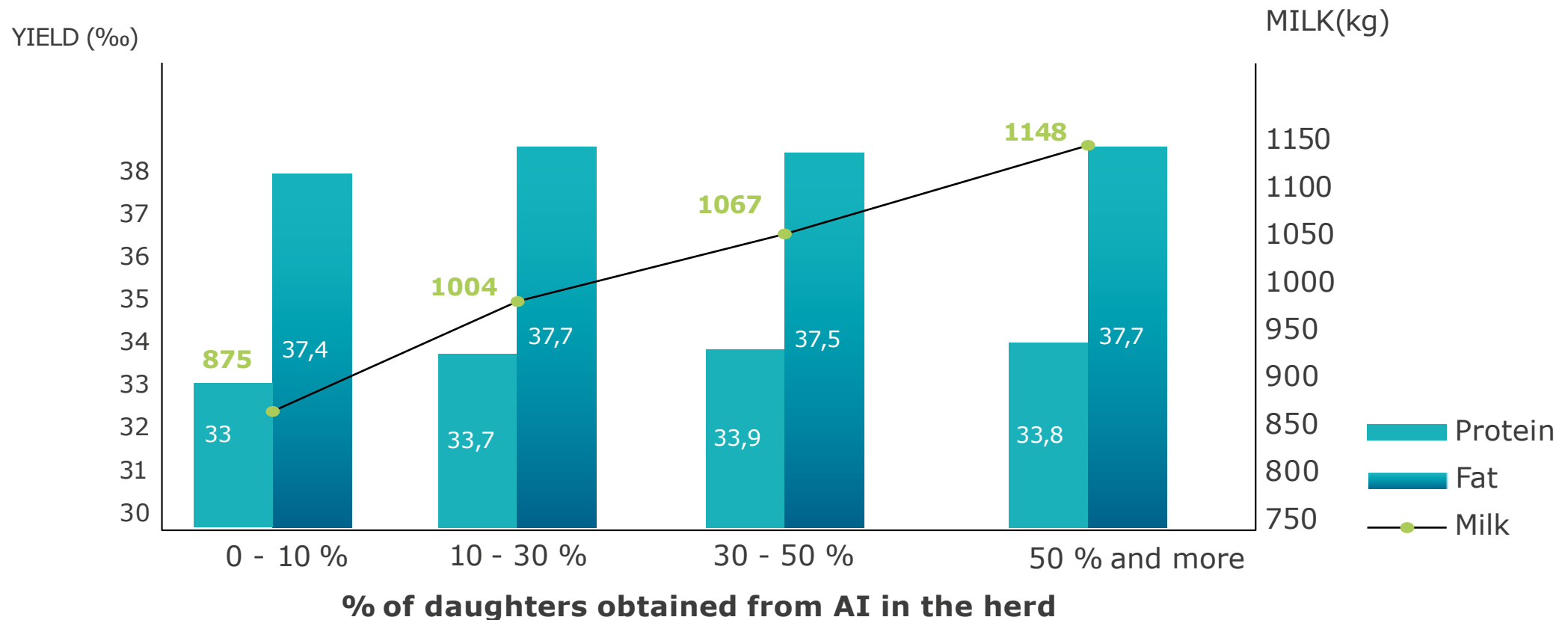


## ➤ Number of goats inseminated per year and Fertility after AI per breed



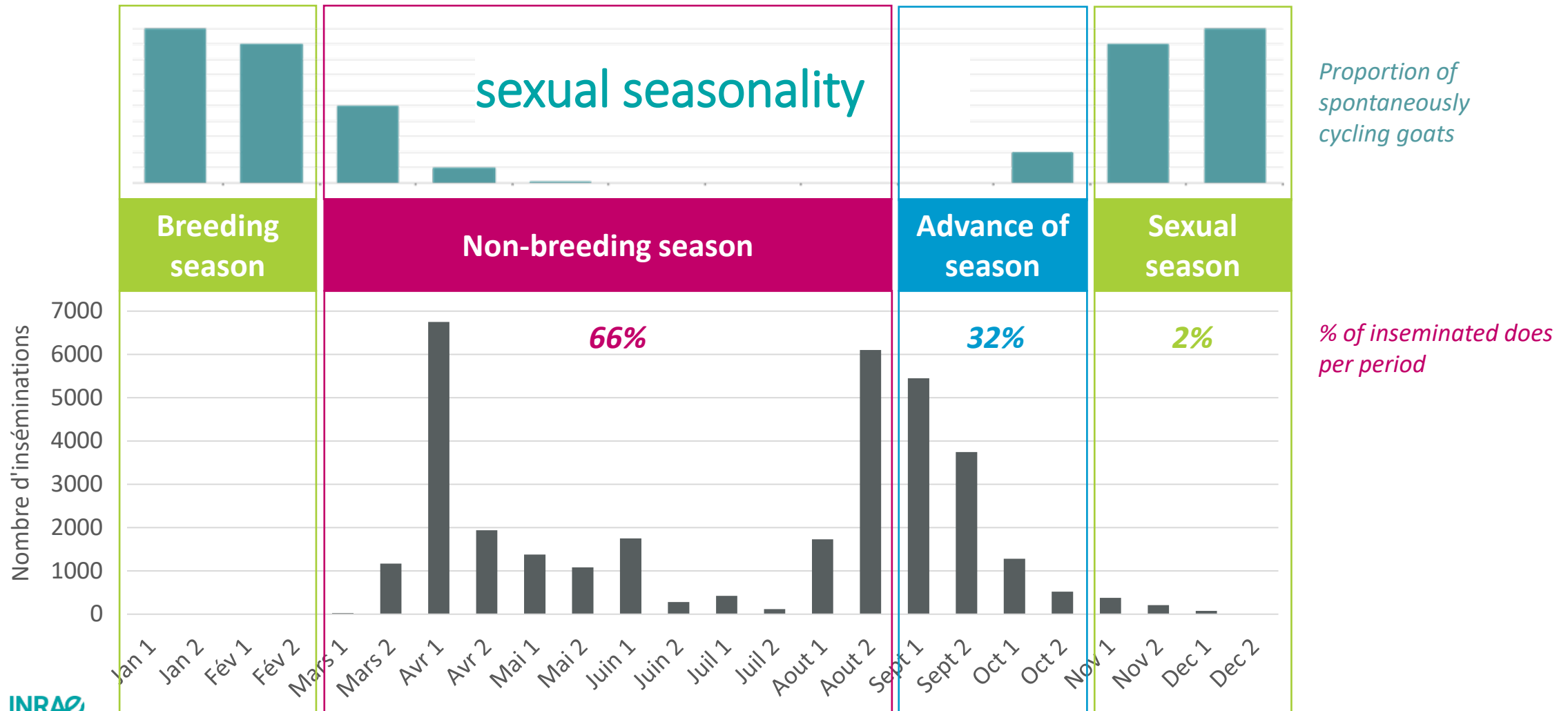
## ➤ Genetic added-value allowed by goat insemination

- Production performances increase with the percentage of daughters born after AI in herds enrolled in official milk recording



# ➤ Number of goats inseminated per fortnight over the year

Source : Innoval 2022



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