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# Mapping of public research institutes on plant breeding

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# Scope & Methodology

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## Aim

Identify key public research institutes working on plant breeding in Western Europe.

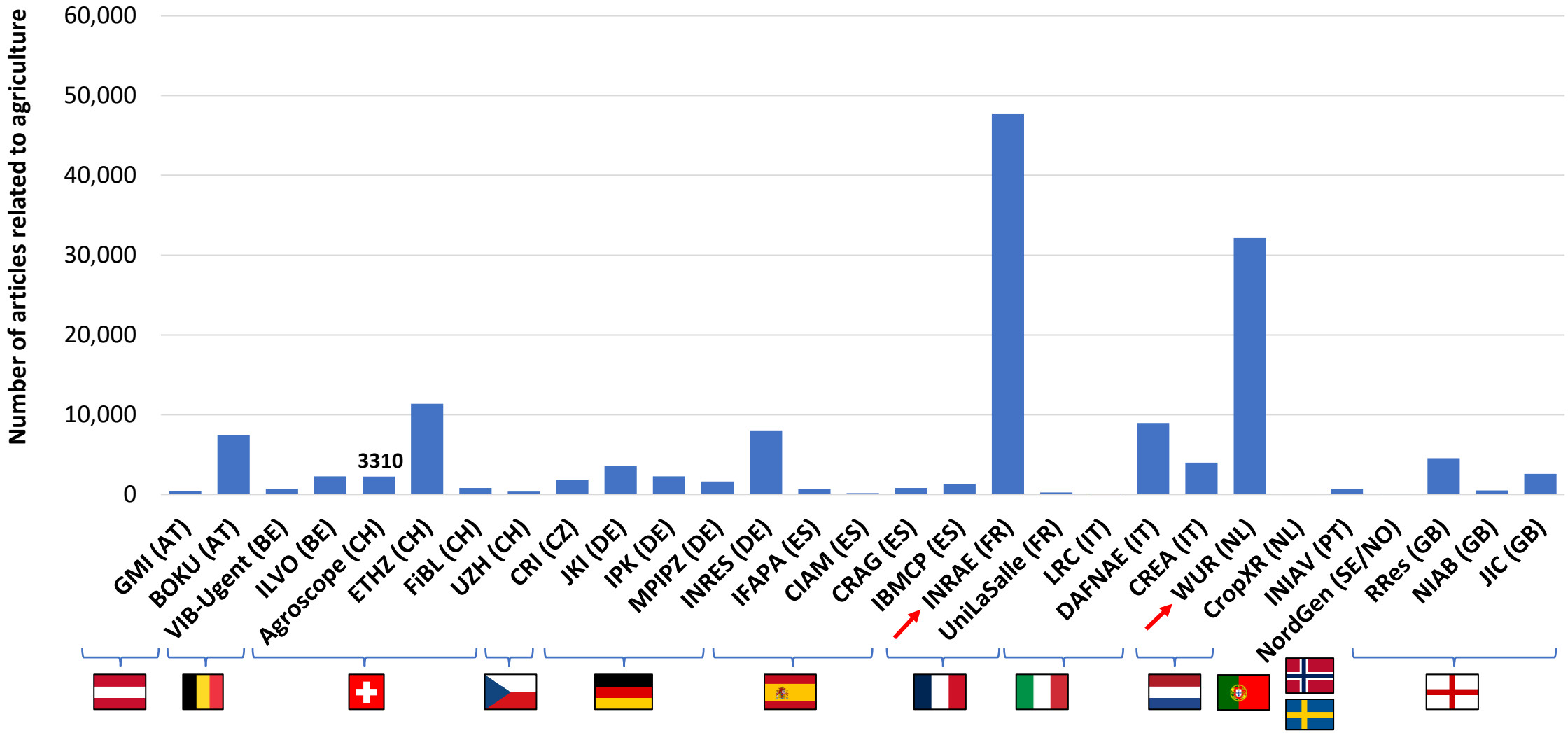
## Process

# Research institutes

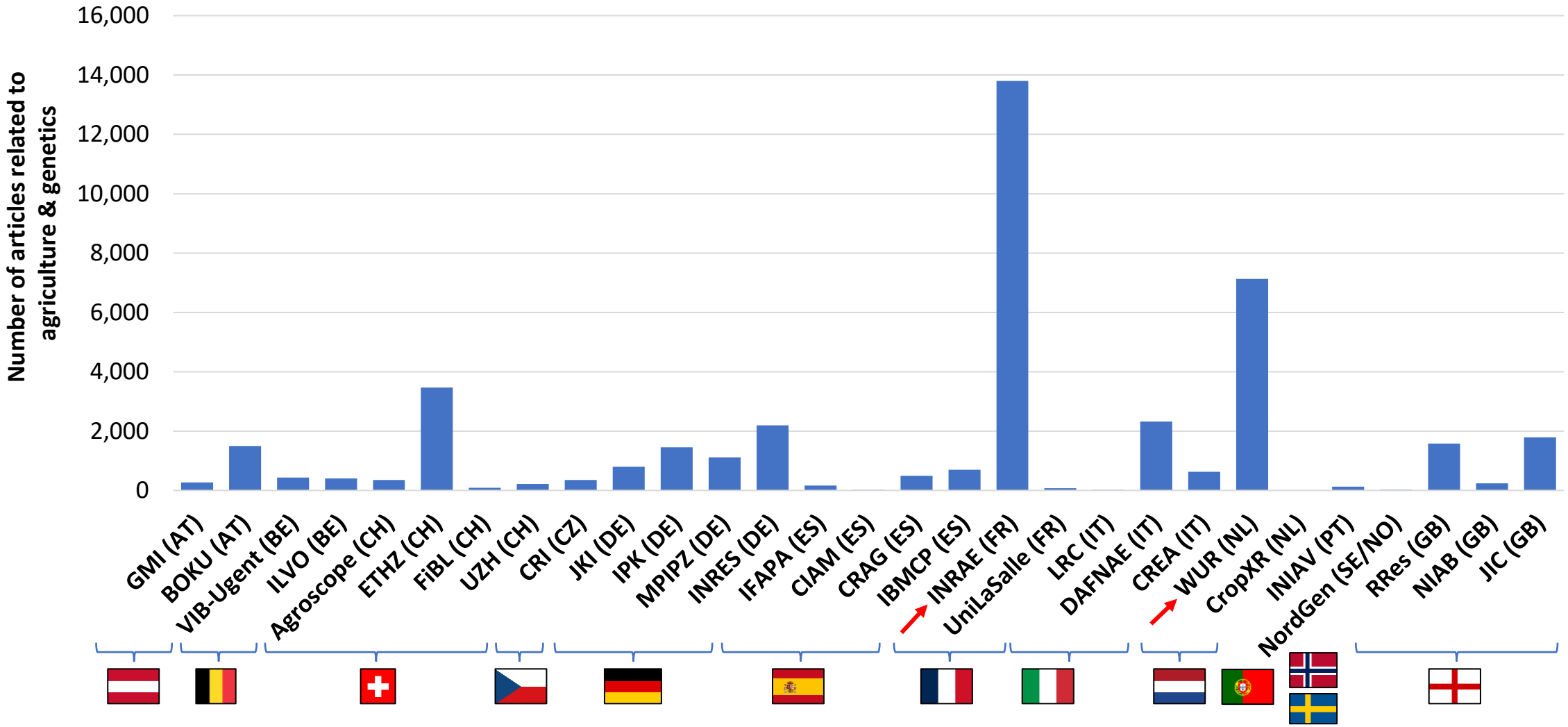

- Scientific articles published
- Patents filed
- European plant variety register (EUPVP)
- News items on industry collaborations & licensing

# Scientific articles

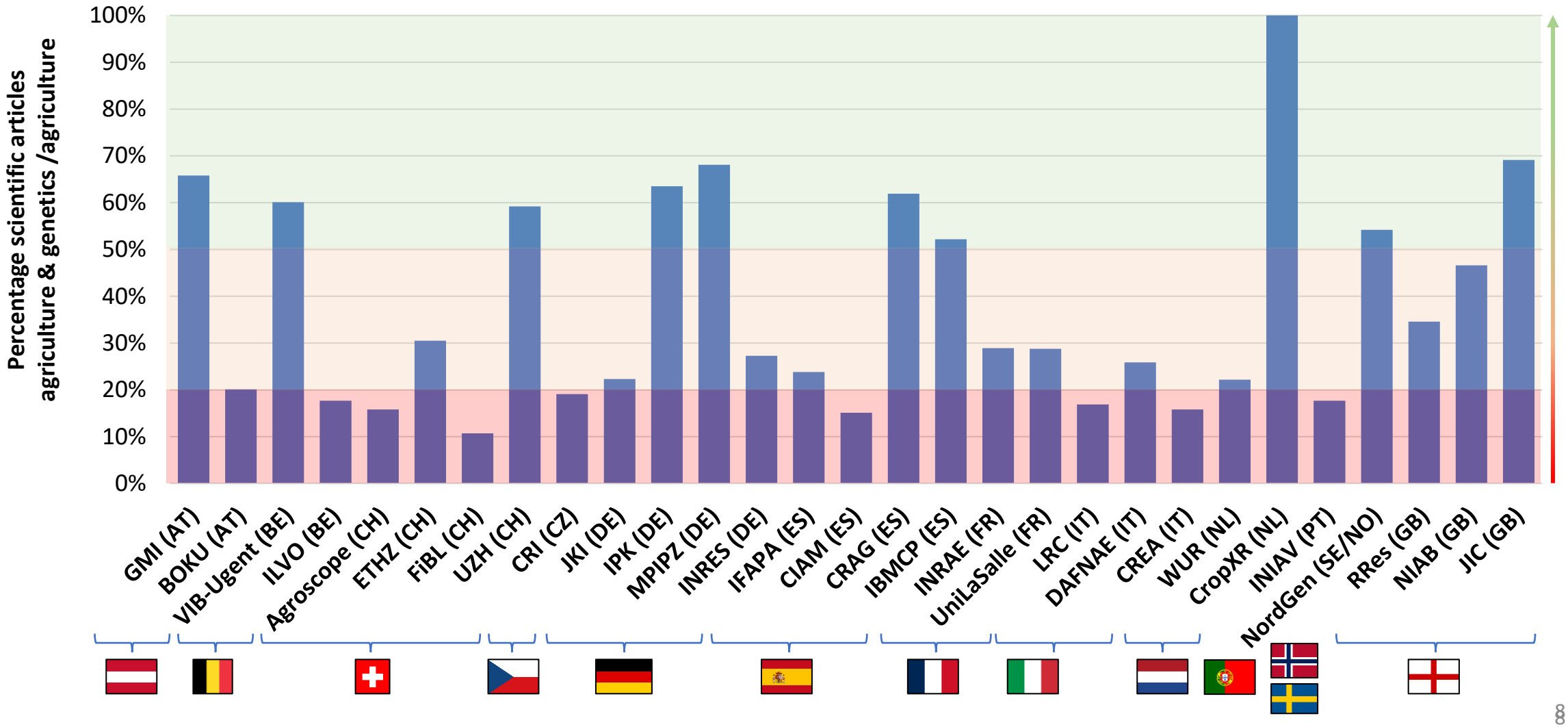
# INRAE and Wageningen University publish the most scientific articles in the field of agriculture (2004-2024)



# INRAE and Wageningen University publish the most scientific articles in the field of agriculture & genetics (2004-2024)



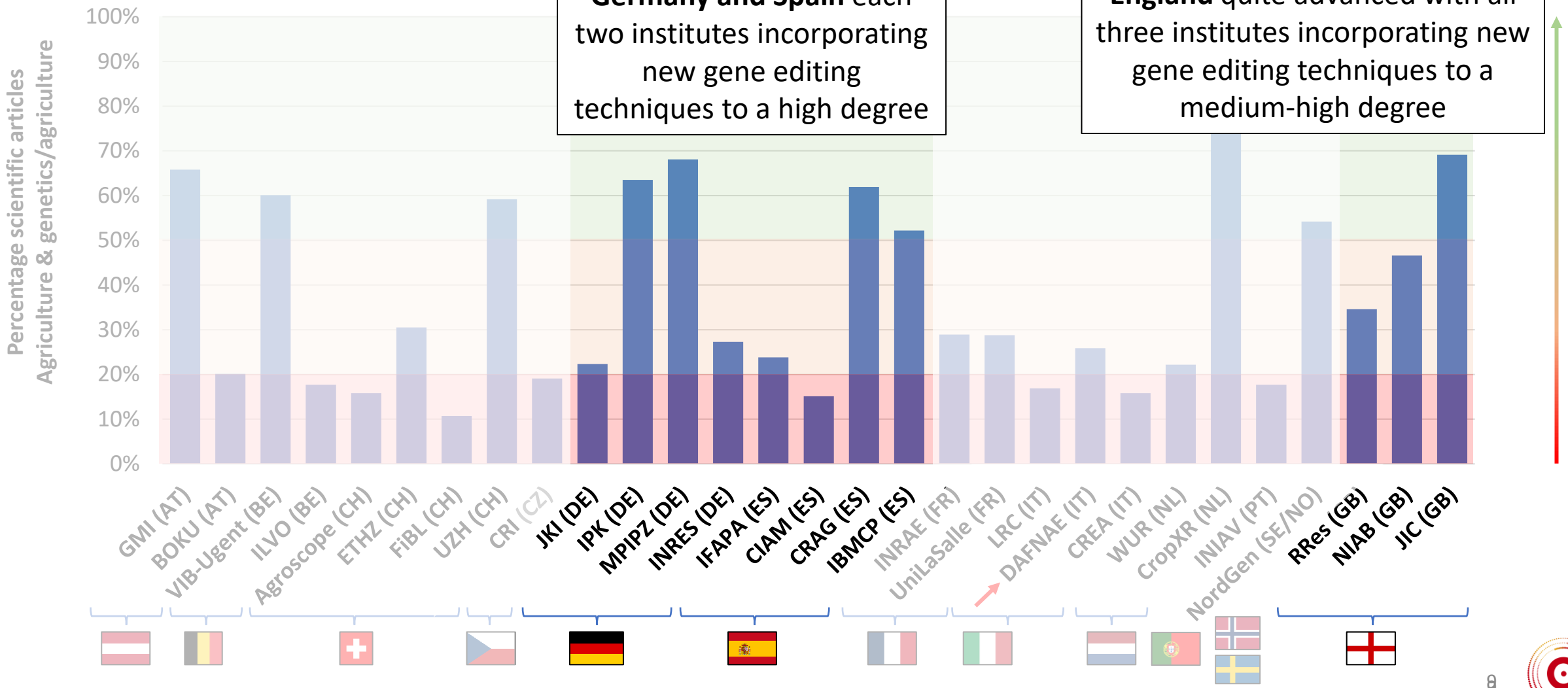
# Indication of institutes incorporating gene editing techniques in plant breeding



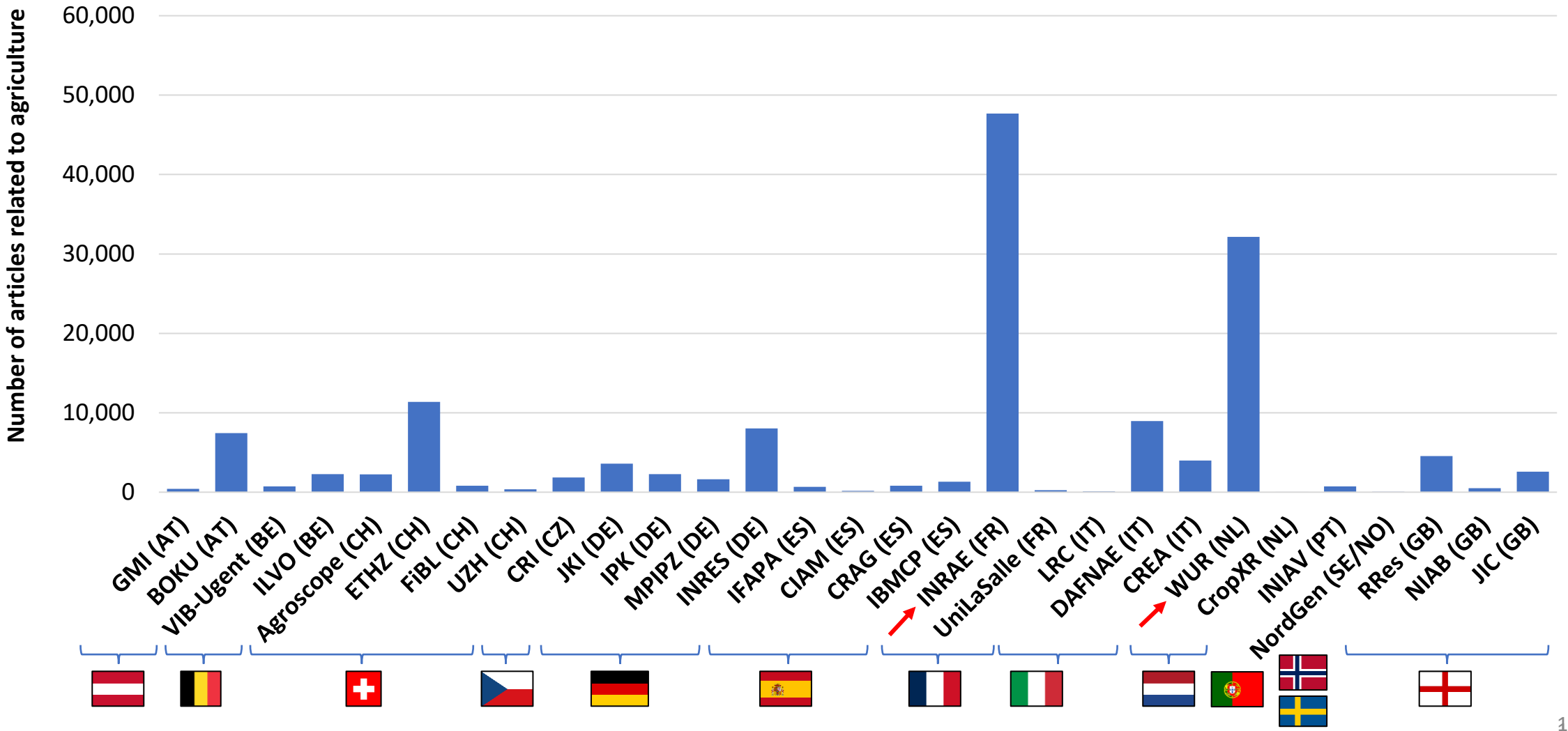
# Indication of institutes incorporating gene editing techniques in plant breeding

**Germany and Spain** each two institutes incorporating new gene editing techniques to a high degree

**England** quite advanced with all three institutes incorporating new gene editing techniques to a medium-high degree

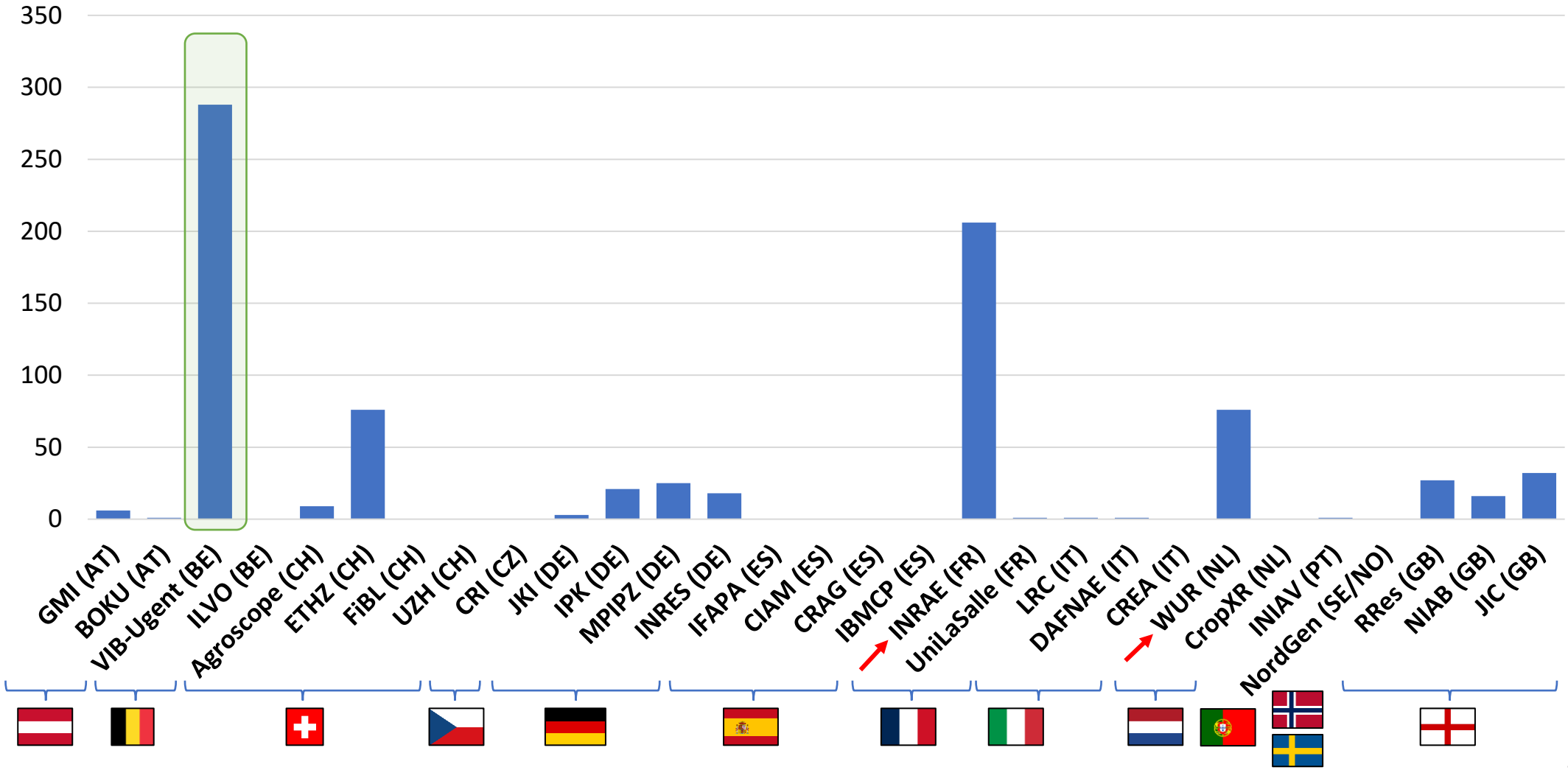


# INRAE and Wageningen University publish the most scientific articles in the field of agriculture

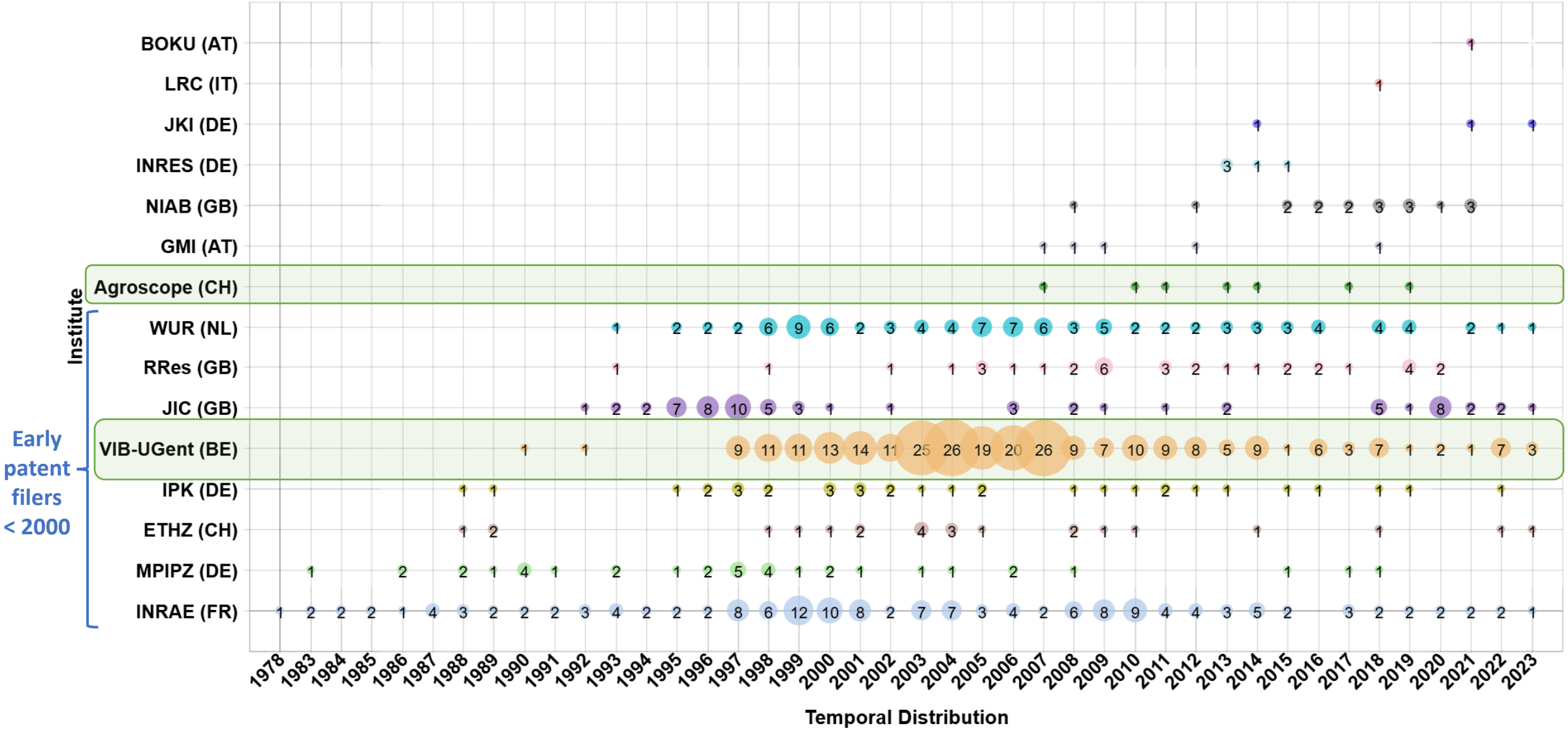


# Patents

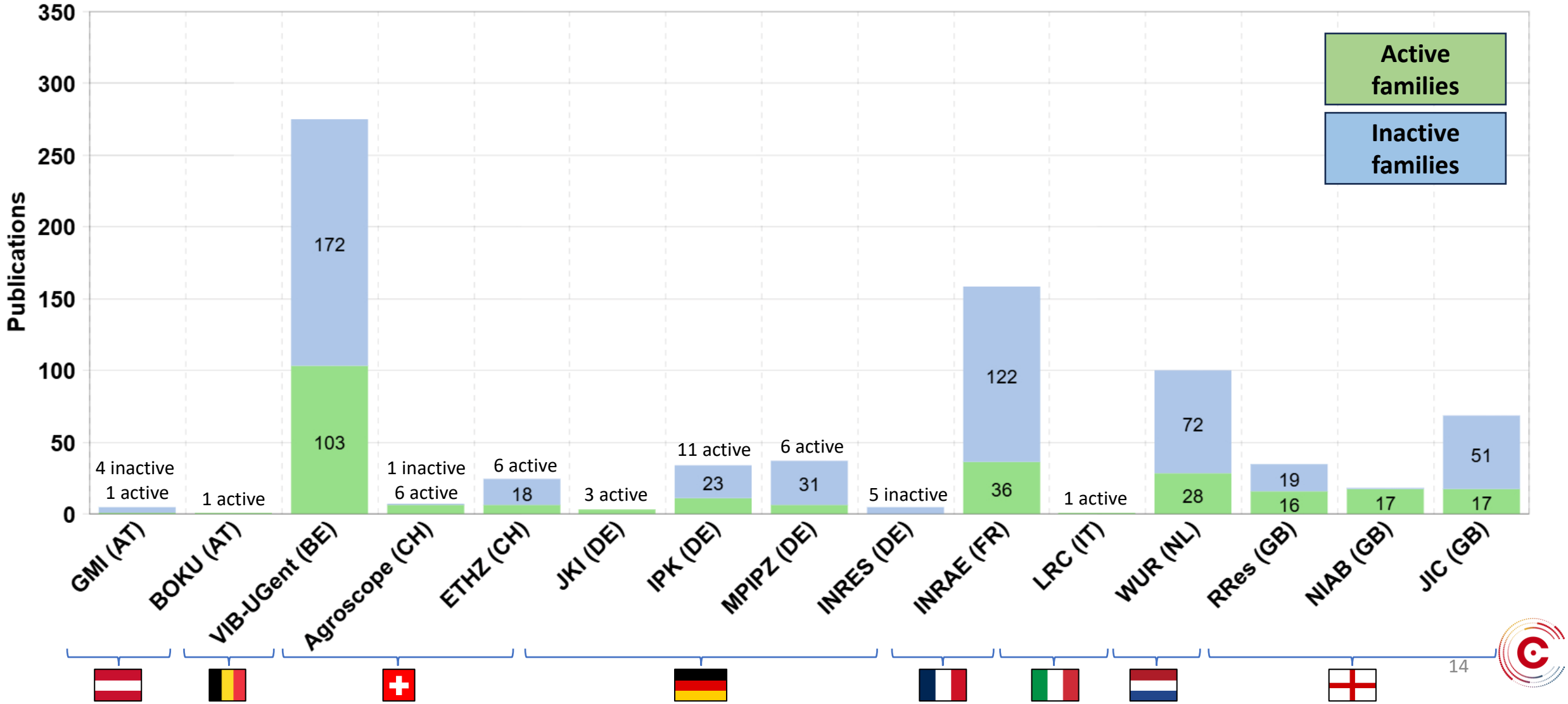
# INRAE and Wageningen University are surpassed by VIB-UGent in number of patents related to agriculture



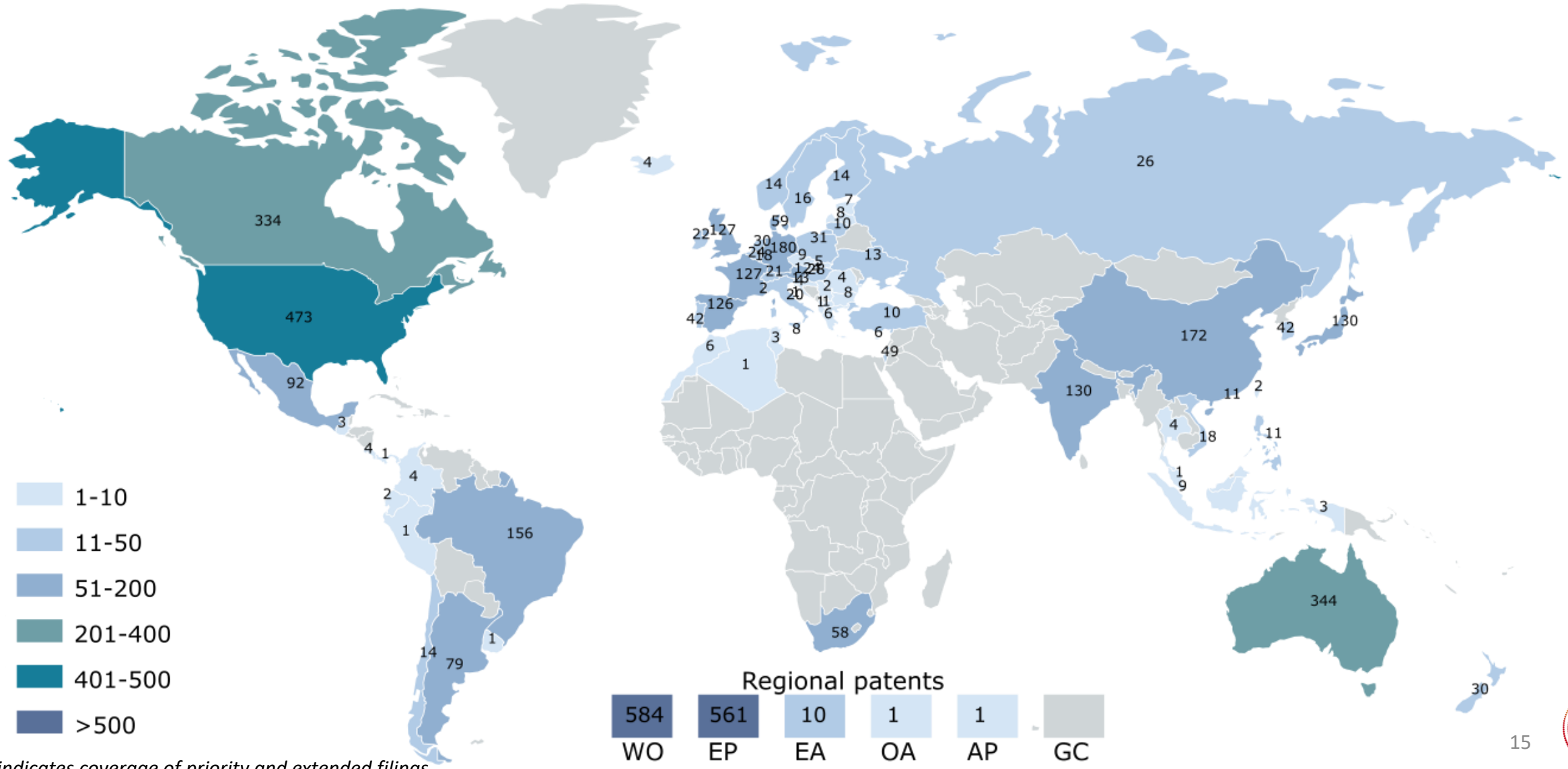
# VIB-UGent most active in 2003-2007; Agroscope submitting patents since 2007



# Many inactive patent families, INRAE and WUR actually not far ahead of English institutes



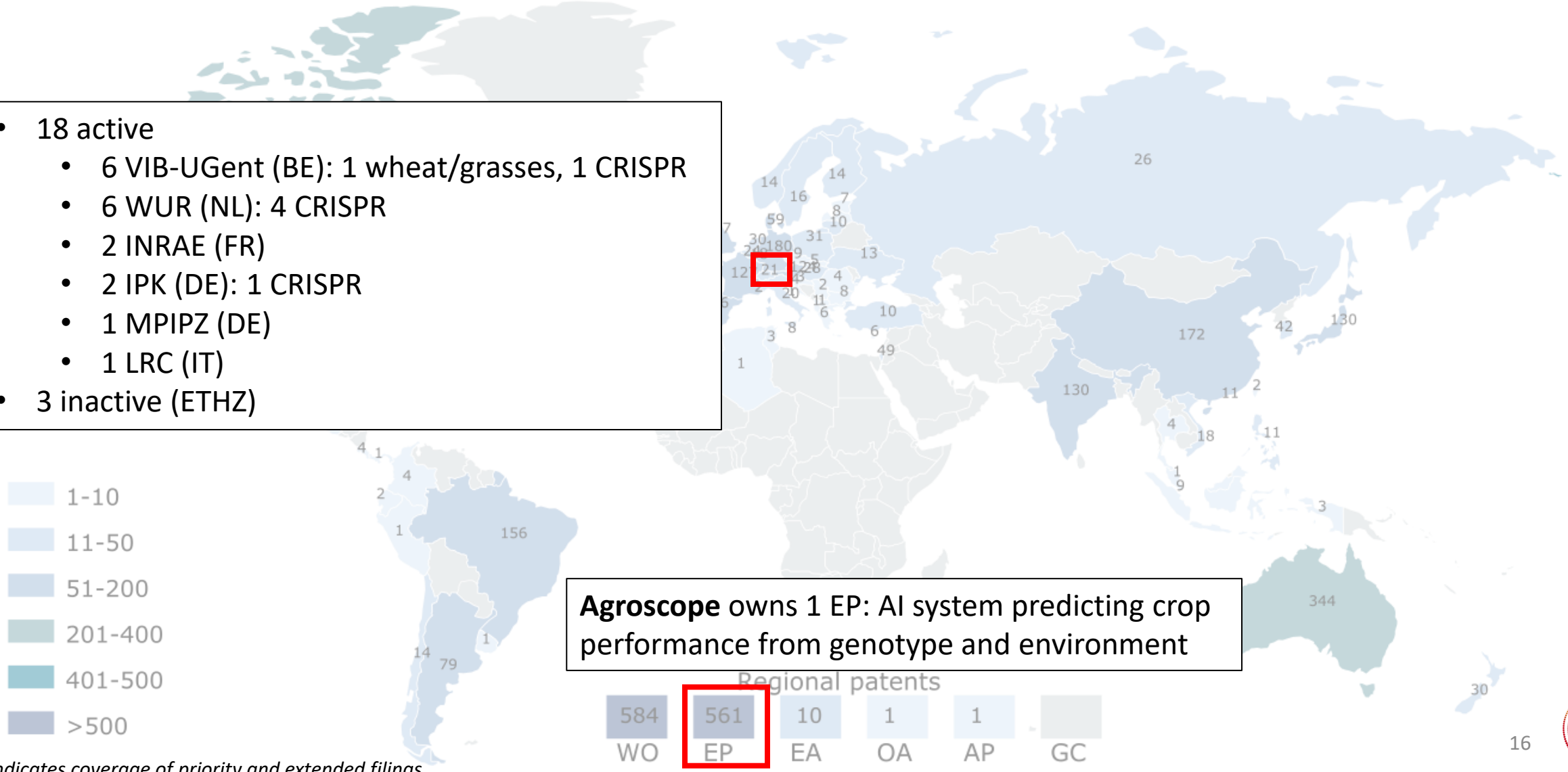
# Besides PCT and EP, many patents filed in US, CA and AU




*Map indicates coverage of priority and extended filings.*

# 21 patent families in Switzerland

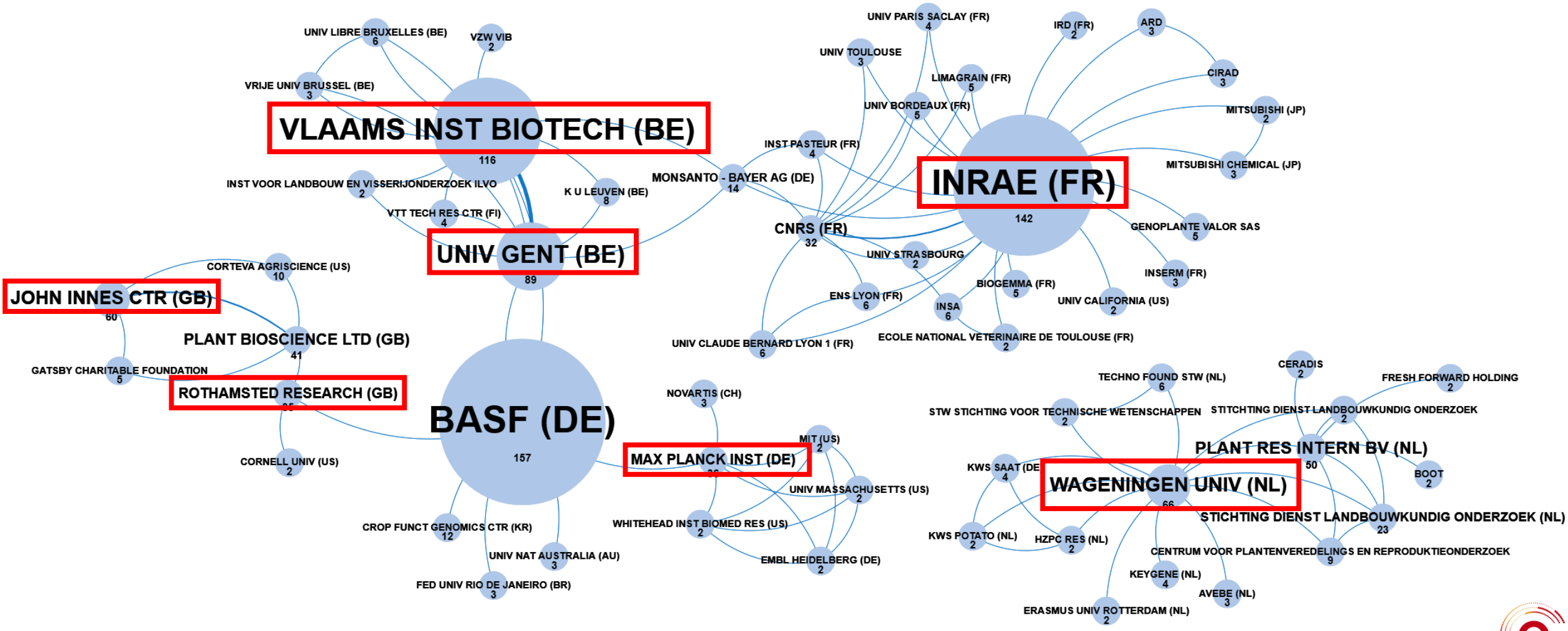
- 18 active
  - 6 VIB-UGent (BE): 1 wheat/grasses, 1 CRISPR
  - 6 WUR (NL): 4 CRISPR
  - 2 INRAE (FR)
  - 2 IPK (DE): 1 CRISPR
  - 1 MPIPZ (DE)
  - 1 LRC (IT)
- 3 inactive (ETHZ)



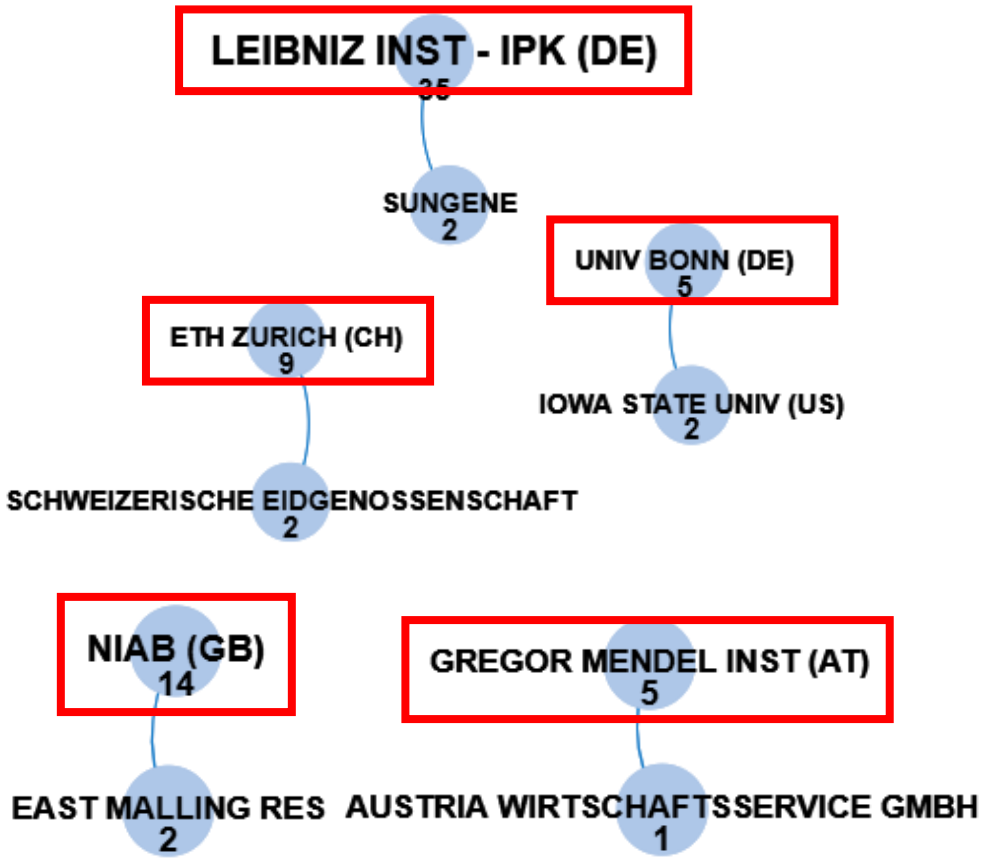

**Agroscope** owns 1 EP: AI system predicting crop performance from genotype and environment

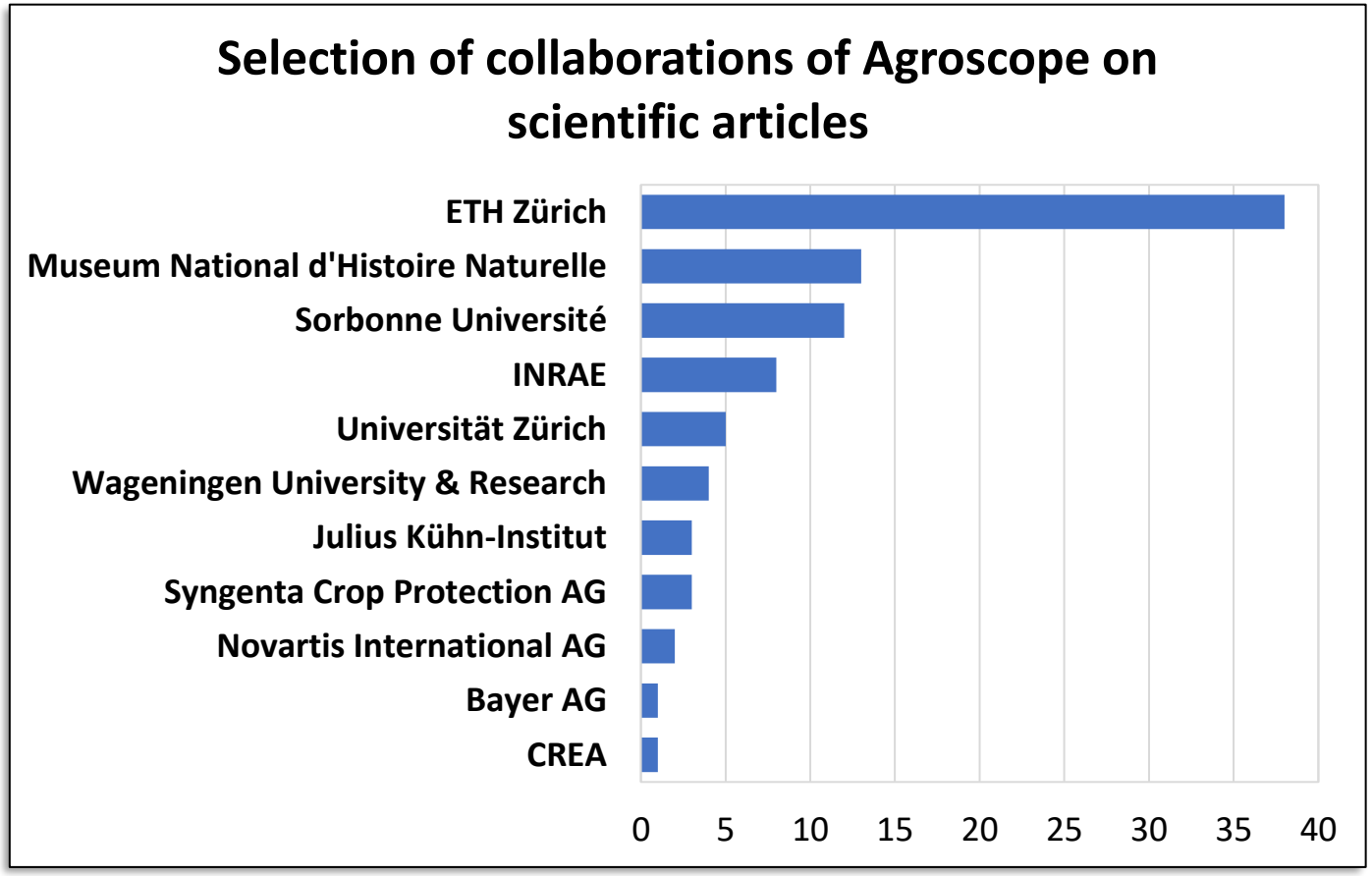
*Map indicates coverage of priority and extended filings.*

# A big collaboration network; particularly INRAE and WUR have industrial partners

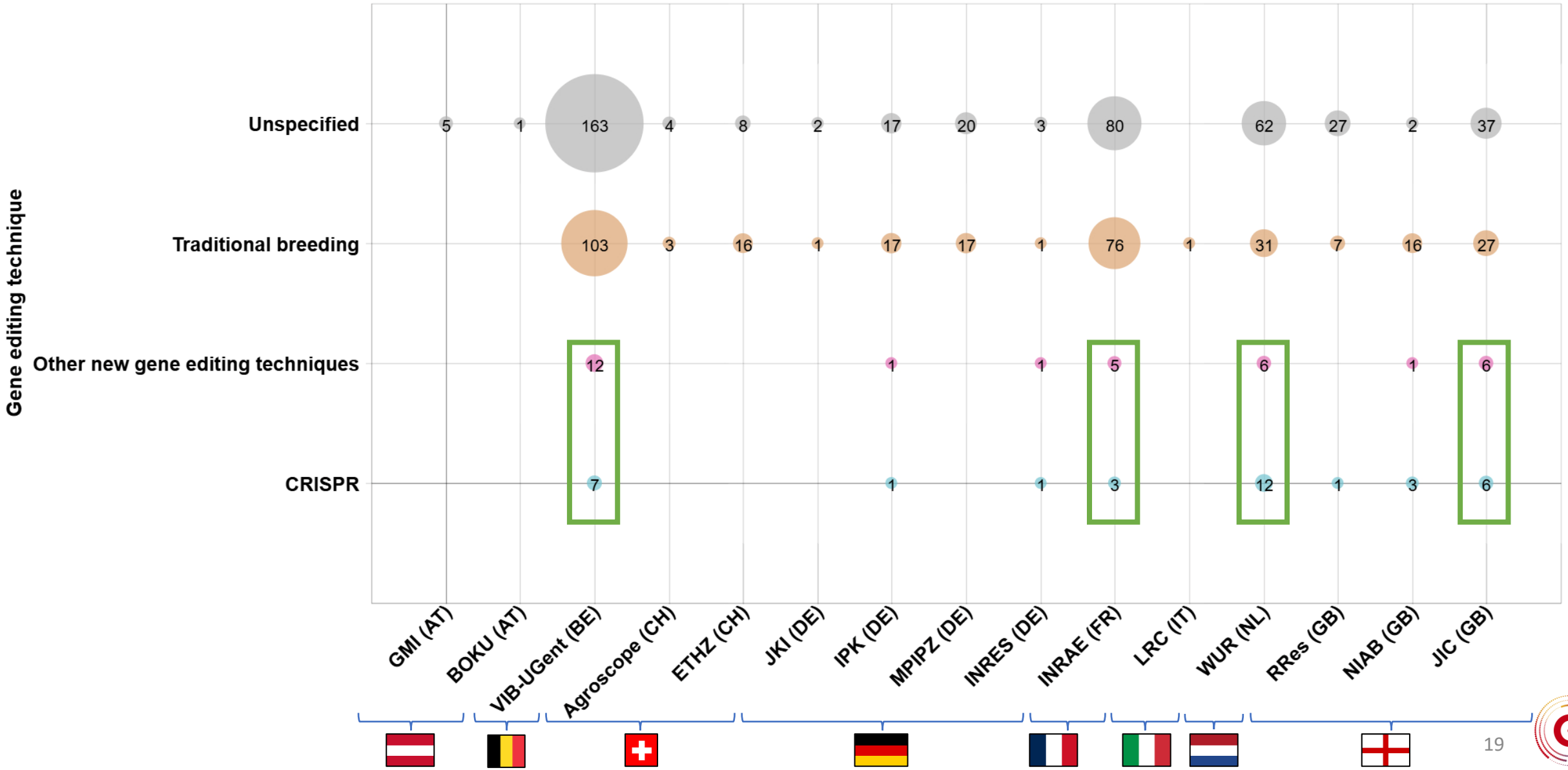


# Multiple research institutions have IP collaborations, except Agroscope, BOKU and JKI

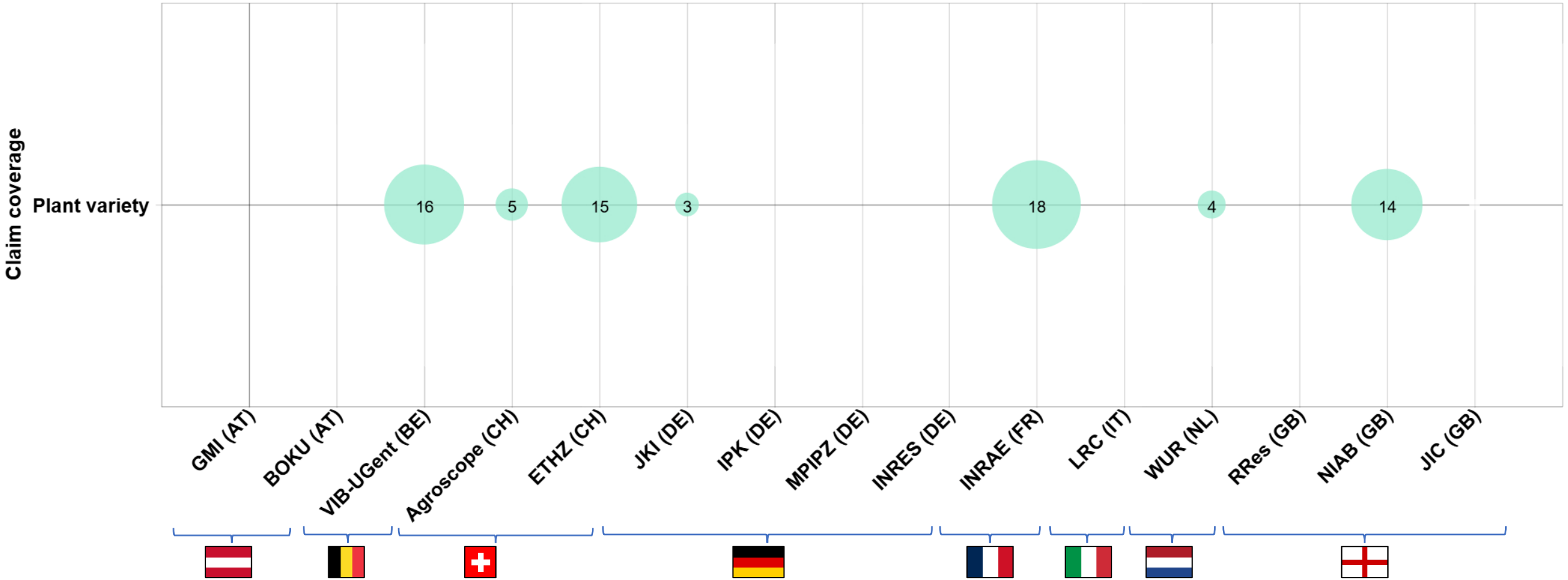


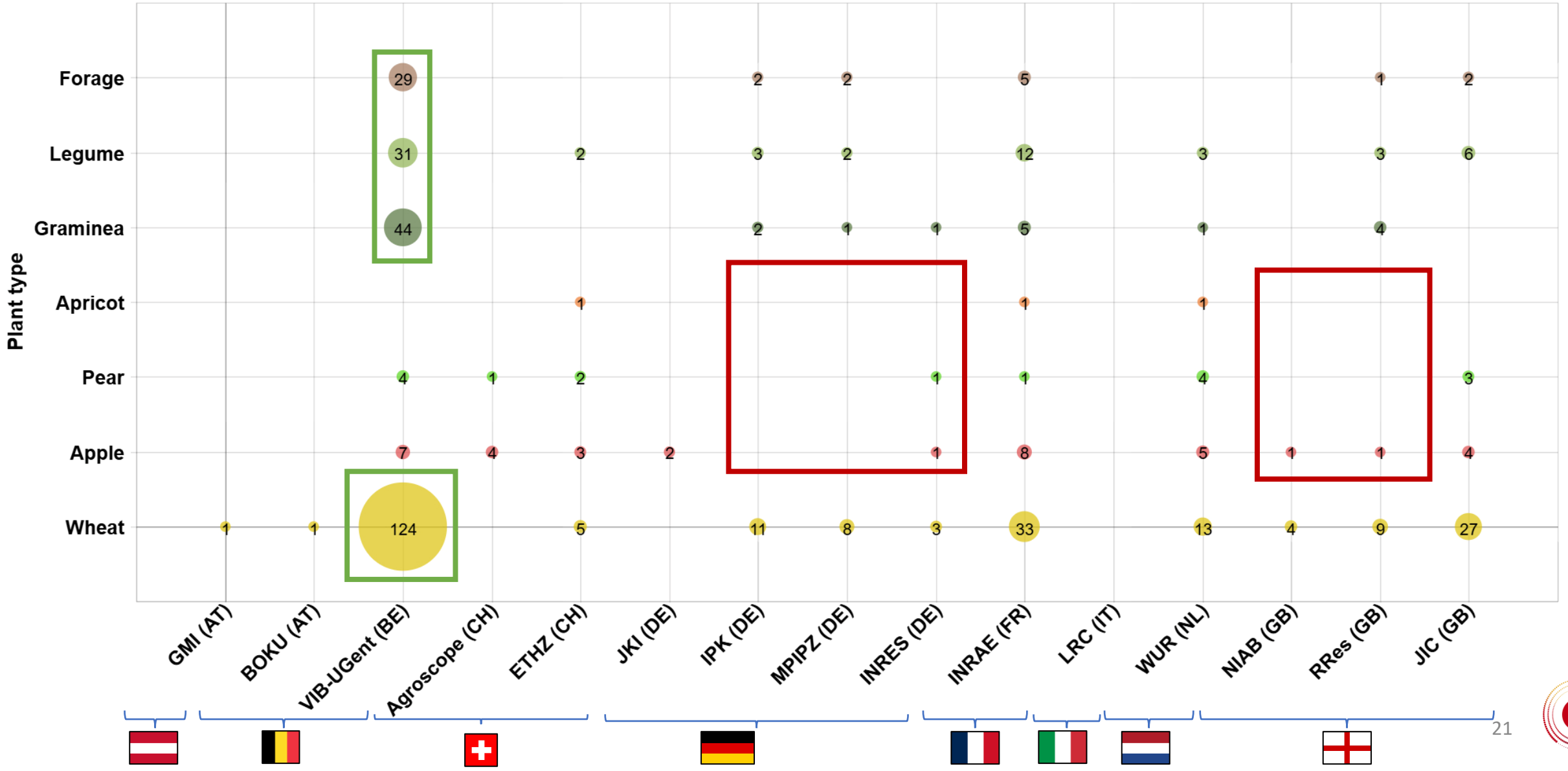
# VIB-UGent, JIC, WUR and INRAE own considerable IP portfolios on new gene editing techniques



# Several institutions own US patents protecting plant varieties, including Agroscope



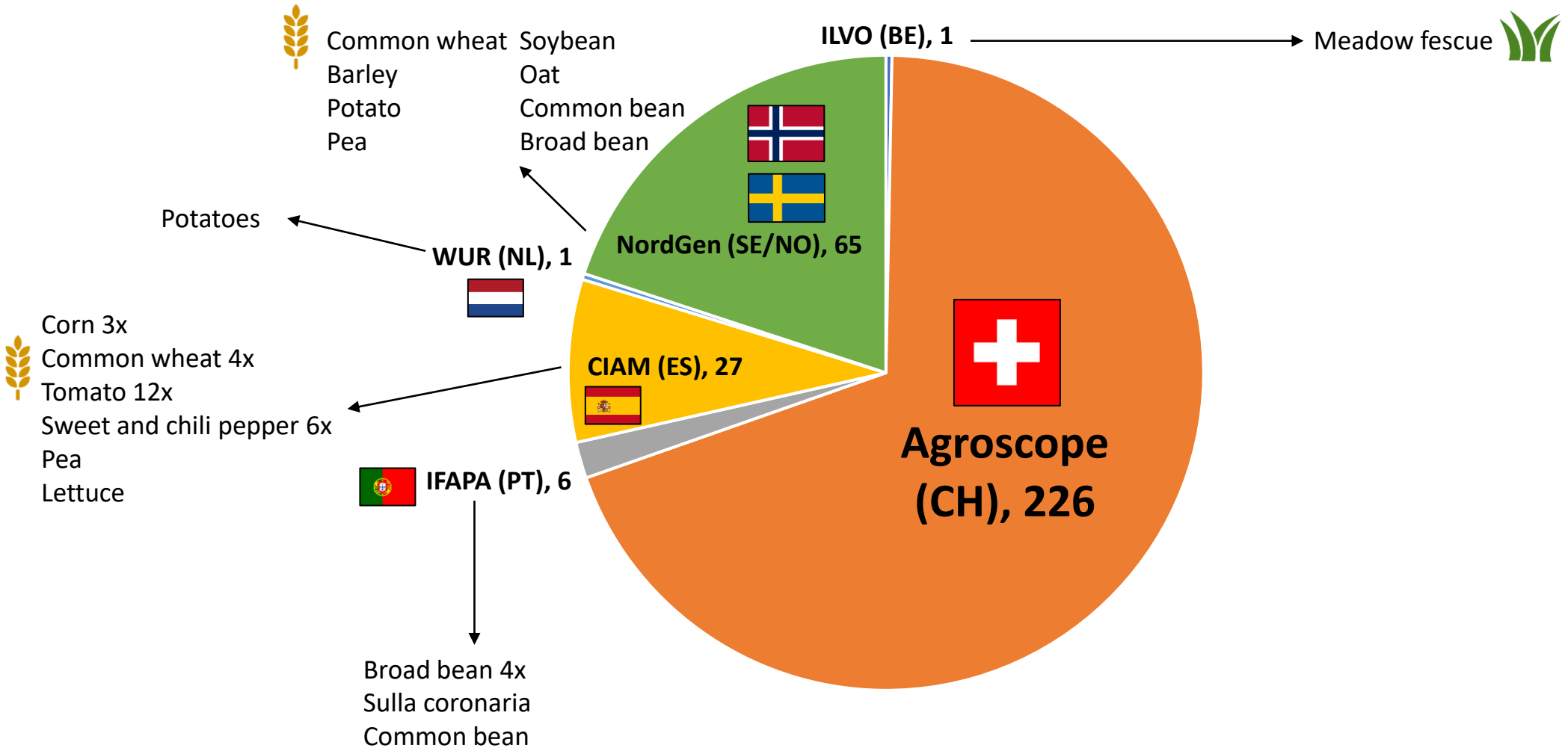
# Most players own IP on multiple plants of interest; VIB-UGent particularly strong in wheat and grasses



# Plant varieties

# Agroscope is by far ahead in protecting plant varieties in EU

*(Other institutes might have partners protecting the plant varieties)*

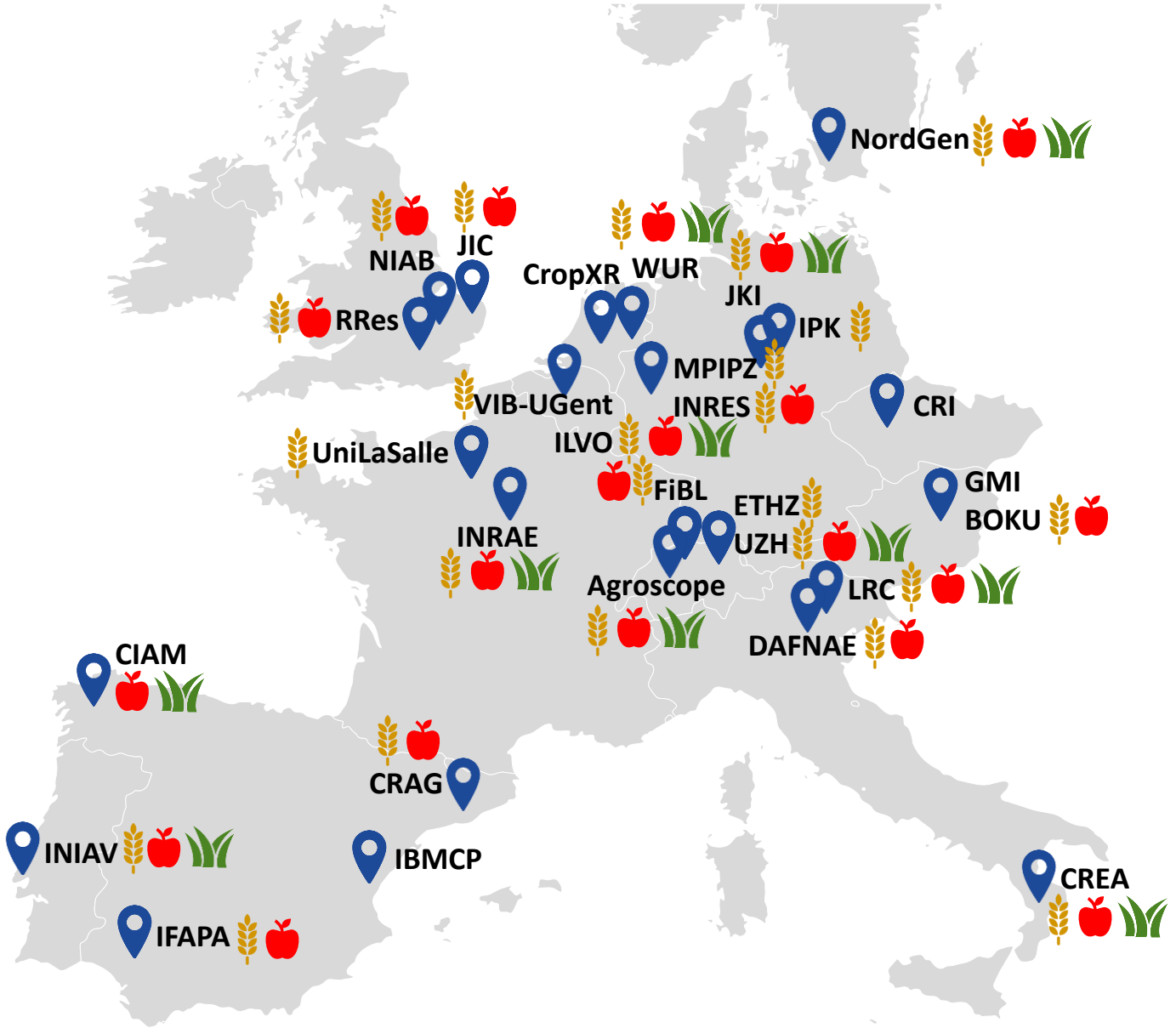





*This is based on information found in the EUPVP – common catalogue; data from the PLUTO database was not accessible.*

# Research on wheat, fruit and grasses

*Based on web search*




*This information is not exhaustive. Some institutes work on other species besides wheat or fruit or grasses; some institutes do not specify the plant types they work on at all.*

# Collaborations & licensing

# Licensing public news


| Institute | Partner | Focus |
|---|---|---|
| NIAB (GB) | Frank P Matthews (GB) | Plums & cherries |
| RRes (GB) | Yield10 (US)<br>Bayer (DE) | Omega3 gene modification<br>Digital farming |
| JIC (GB) | Dow Agrosciences (US)<br>Open for licensing | Root enhancement technology<br>Wheat yellow rust resistance |
| INIAV (PT) | Continente (PT) | Rice |
| WUR (NL) | Open for licensing to non-commercial partners | 5 free CRISPR-Cas licenses for gene-editing of plants |

*This information is not exhaustive.*

# Joint industry projects


*This information is not exhaustive.*

# Agroscope is well involved in industry collaborations

| Institute | Partner | Plant type | Focus |
|---|---|---|---|
| Agroscope (CH) | CSEM (CH) | - | Optimizing the food supply chain |
| | Sunrise (CH)/Huawei | - | 5G smart farming |
| | Yasai (CH)/Fenaco (CH) | - | Vertical farming |
| ETHZ (CH) | Syngenta (CH) | Rice | Beta-carotine enriched Golden Rice |

*This information is not exhaustive.*

# English institutes all have industry collaborations

| Institute | Partner | Plant type | Focus |
|---|---|---|---|
| Agroscope (CH) | CSEM (CH) | - | Optimizing the food supply chain |
| | Sunrise (CH)/Huawei | - | 5G smart farming |
| | Yasai (CH)/Fenaco (CH) | - | Vertical farming |
| ETHZ (CH) | Syngenta (CH) | Rice | Beta-carotine enriched Golden Rice |
| NIAB (GB) | Unilever (GB) | Mustard, mint | Low-emission, water-efficient farming for better yields |
| | Bayer (DE) | Wheat, strawberry | Genetic diversity and root symbiosis (wheat), flowering control (strawberry) and phenotyping technology |
| RRes (GB) | Sugarox (GB) | Wheat | Identifying markers predicting T6P response |
| | BASF (DE) | - | Sustainable agriculture |
| JIC (GB) | Germinal (GB) | Pea | Flavorless peas as soy replacement |

*This information is not exhaustive.*

# VIB-UGent, WUR, INRAE and JKI have collaborations with big agricultural companies (Corteva, Syngenta, etc.)

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| VIB-UGent (BE) | Corteva Agriscience (US) | Maize | Prolonging female fertility |
| WUR (NL) | DDS Bio (KR) | - | Digital breeding and farming |
| | Dow Agrosciences (US) | Potato | Improve starch quality using EXZACT™ Precision Tech |
| | Chiquita (CH)/ Keygene (NL)/ MusaRadix (NL) | Banana | New variety resistant to TR4 and Black Sigatoka |
| WUR (NL), INRAE (FR), JKI (DE) | Syngenta (CH)/Hiphen (FR)/ Napiferyn Biotech (PL)/RN20 (FR)/Mas Seeds (FR) | Sunflowers | Resistance to the impacts of global warming |



*This information is not exhaustive.*

# Key take-aways

# Overall Key Take-aways (1/2)

- **INRAE and WUR lead in scientific output**, especially in agriculture and genetics.
- **Gene editing is becoming a core component** of research strategies, particularly in **England, Germany, and Spain**.
- **VIB-UGent leads in patenting activity**, with a clear emphasis on protecting cutting-edge technologies in crop improvement and gene editing.
- **Agroscope distinguishes itself in plant variety protection**, with the largest number of EU-registered varieties — a strong asset in applied breeding.
- **Top-performing institutes combine science, innovation, and partnerships** — WUR, INRAE, VIB-UGent, and the English institutes (JIC, RRes, NIAB) all show strong research output, active patenting or licensing, and deep ties with industry.

# Agroscope's positioning & outlook

## Agroscope's strenghts

- **Leading in plant variety protection** (226 EU-registered varieties)
- **Active in public–private collaborations** (e.g. smart farming, food chain)
- **Innovative in digital breeding** (AI-based crop performance patent)

## Opportunities for further impact

- **Expand gene editing research** (e.g. CRISPR) to strengthen scientific edge
- **Protect more innovations** to boost visibility and funding potential
- **Broaden strategic partnerships** around emerging technologies