



**Brussels, 19 November 2024  
(OR. en)**

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**Interinstitutional File:  
2023/0226(COD)**

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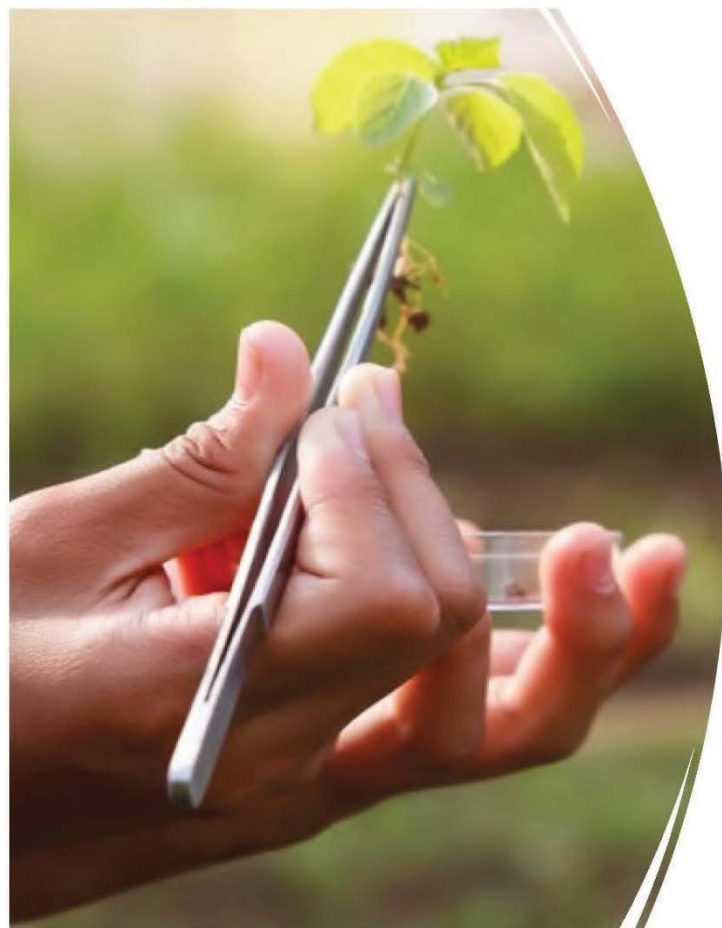
**NOTE**

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**From:** General Secretariat of the Council  
**To:** Delegations  
**Subject:** WP Innovation in Agriculture – Meeting of 19 November 2024 – Item 1c:  
Presentation of the DETECTIVE project

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Following the meeting of the Working Party on Genetic Resources and Innovation in Agriculture (Innovation in Agriculture) of 19 November 2024, delegations will find in annex the presentation given by the representative of the EU-funded research project DETECTIVE.



## Detection of NGT products to promote innovation in the European Union

Working Party on Genetic Resources and Innovation in Agriculture  
Brussels, 19.11.2024

Dennis Eriksson, Assoc.Prof., Dr.  
Swedish University of Agricultural Sciences  
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# The context of DETECTIVE



One of the **Farm to Fork Strategy's** priorities is to ensure traceability and authenticity, enhance transparency and promote innovation with **NGTs**.

NGT-derived products are currently **regulated as GMOs**.

**Difficulty to differentiate** certain NGT-derived products against products that are not GMO-regulated.

Under the current circumstances, **market control will fail** to detect unknown NGT-derived products.



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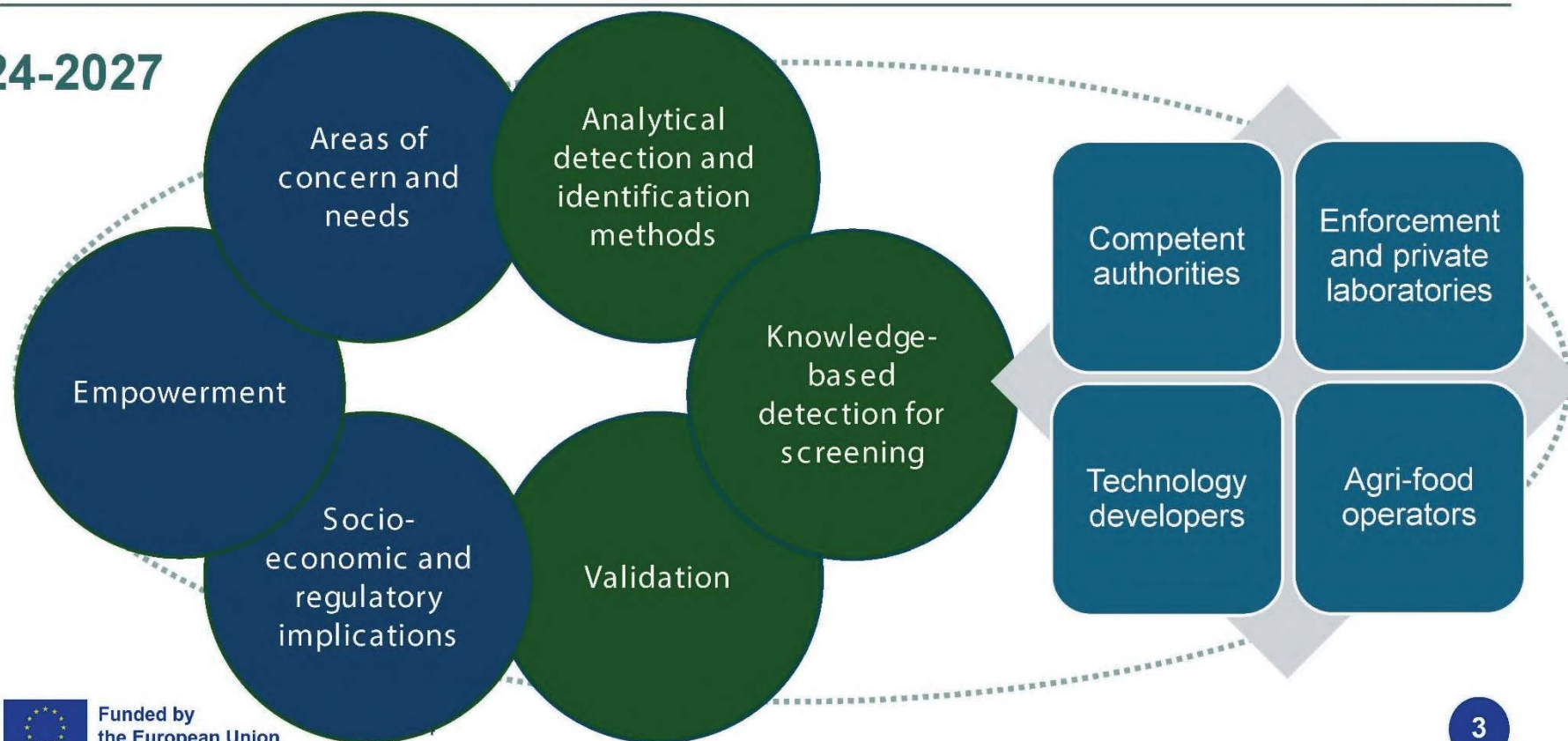
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# This is DETECTIVE



2024-2027



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# This is DETECTIVE



SMEs



Associated Partners



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Plant and animal breeding

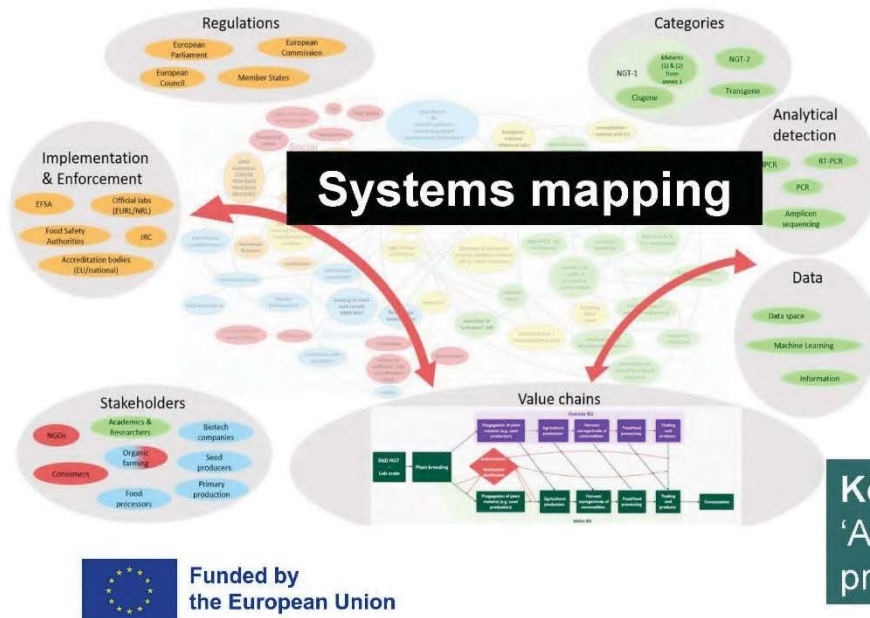
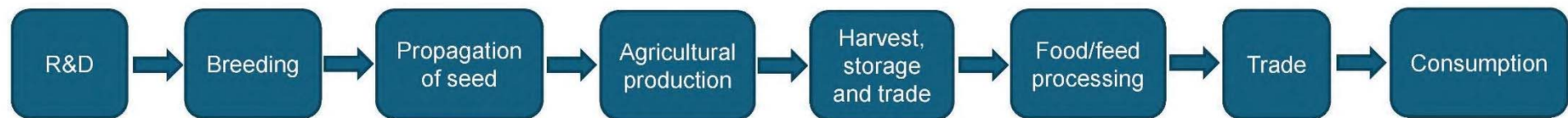


ENGL laboratories



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# Areas of concern and needs



## Responsible Research and Innovation

- ✓ Engagement of stakeholders
- ✓ Identification and prioritisation of needs
- ✓ Co-creation of empowerment plan

**Key Performance Indicator:**  
 'Areas of concern' identified for ≥10 different agri-food NGT products, based on ≥45 actively involved stakeholders



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# Analytical detection and identification methods - targeted

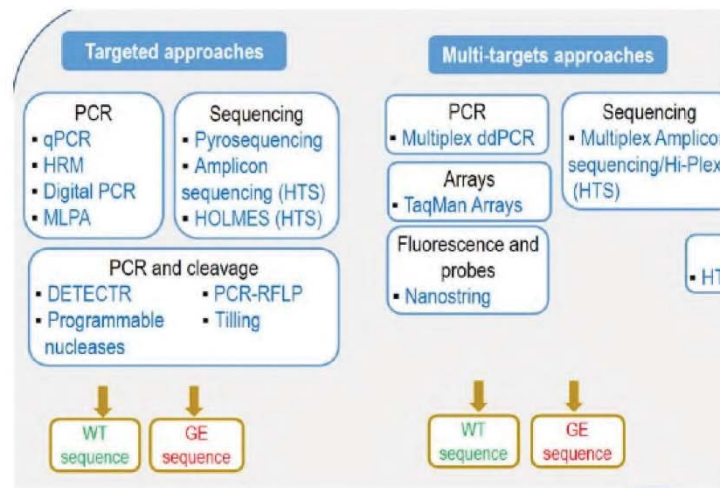
Criteria for selecting samples
NGT category
Commercial status
Genome complexity
Crops traded internationally
Plants; animals



NGT	Single edit/modification	Multiple edits
CRISPR/Cas	Soybean, rice, wheat, chicory	Soybean
Cisgenic	Potato	

- ✓ For authorisation purpose
- ✓ Traceability to enable consumer choice

**Key Performance Indicator:**  
 ≥12 methods tested for detection and traceability of NGT products; tested on ≥10 different NGT-derived plant and animal samples

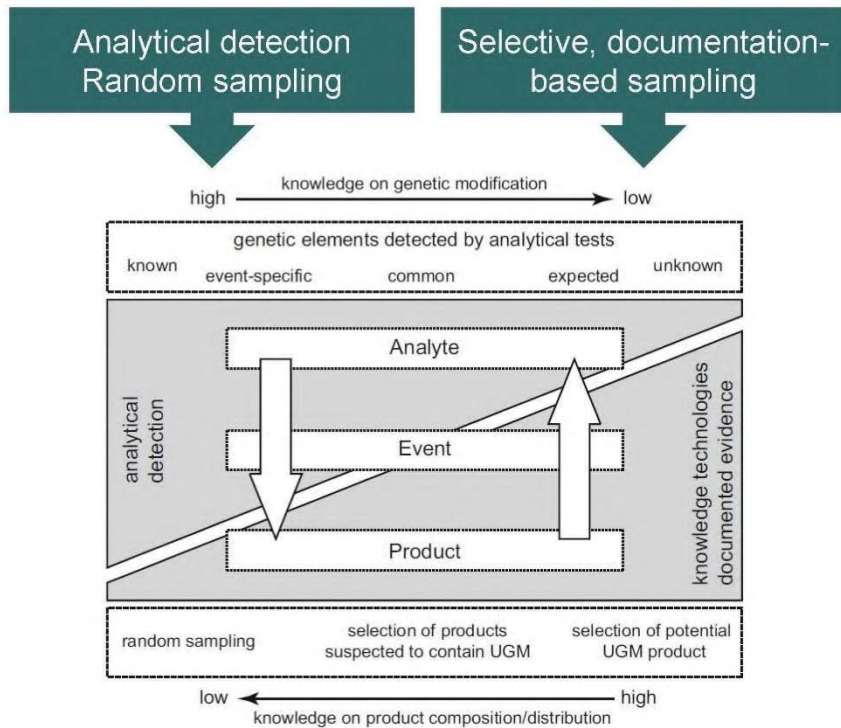


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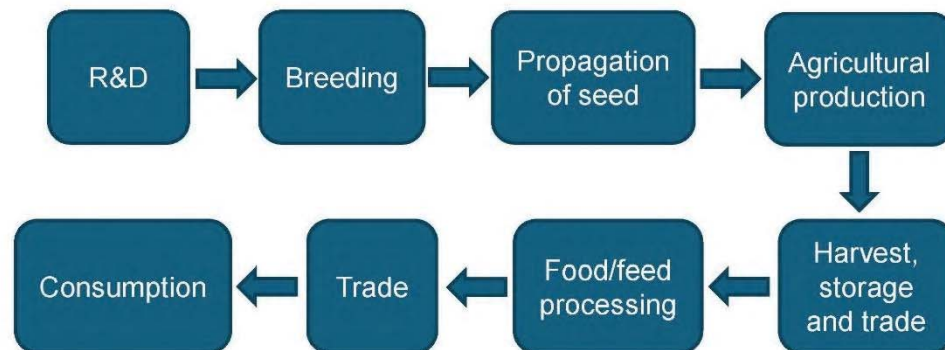


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# Knowledge-based detection for screening



✓ For border control  
 ✓ Unknown, or unauthorised, NGT products



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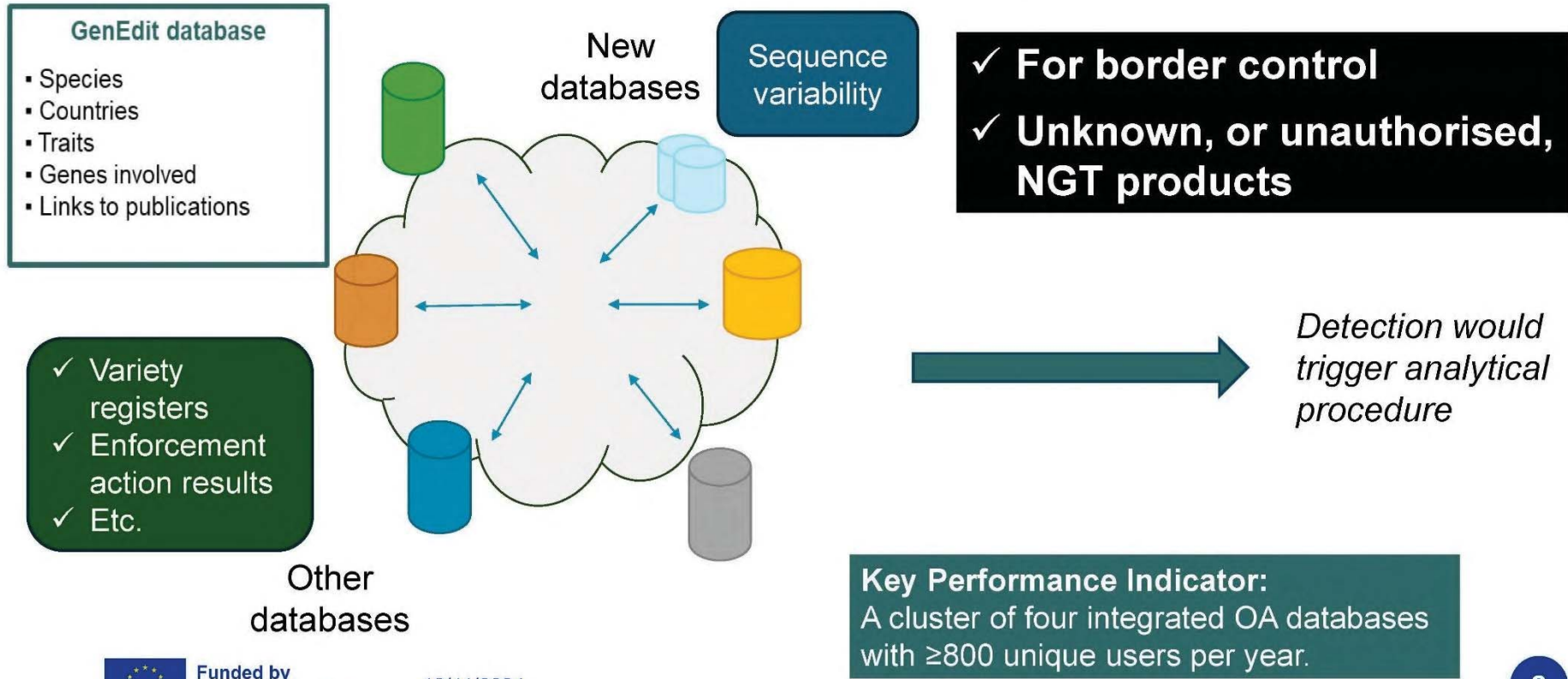
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(Ruttink et al. 2010)

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# Knowledge-based detection for screening



✓ **For border control**  
 ✓ **Unknown, or unauthorised, NGT products**

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# Analytical detection and identification methods - untargeted

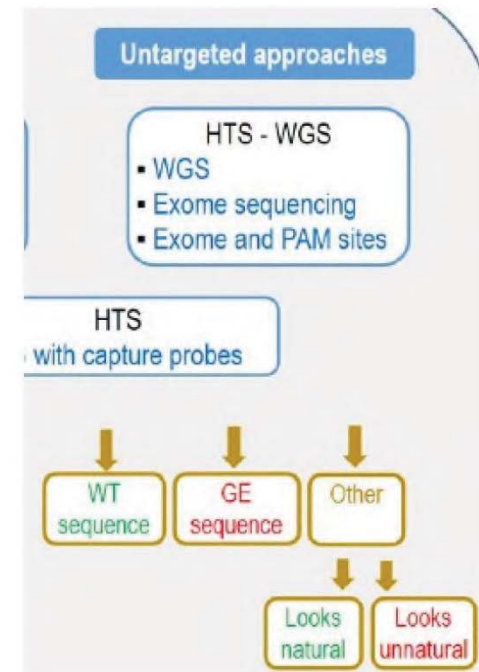


Screening methods for **unknown NGT modifications**

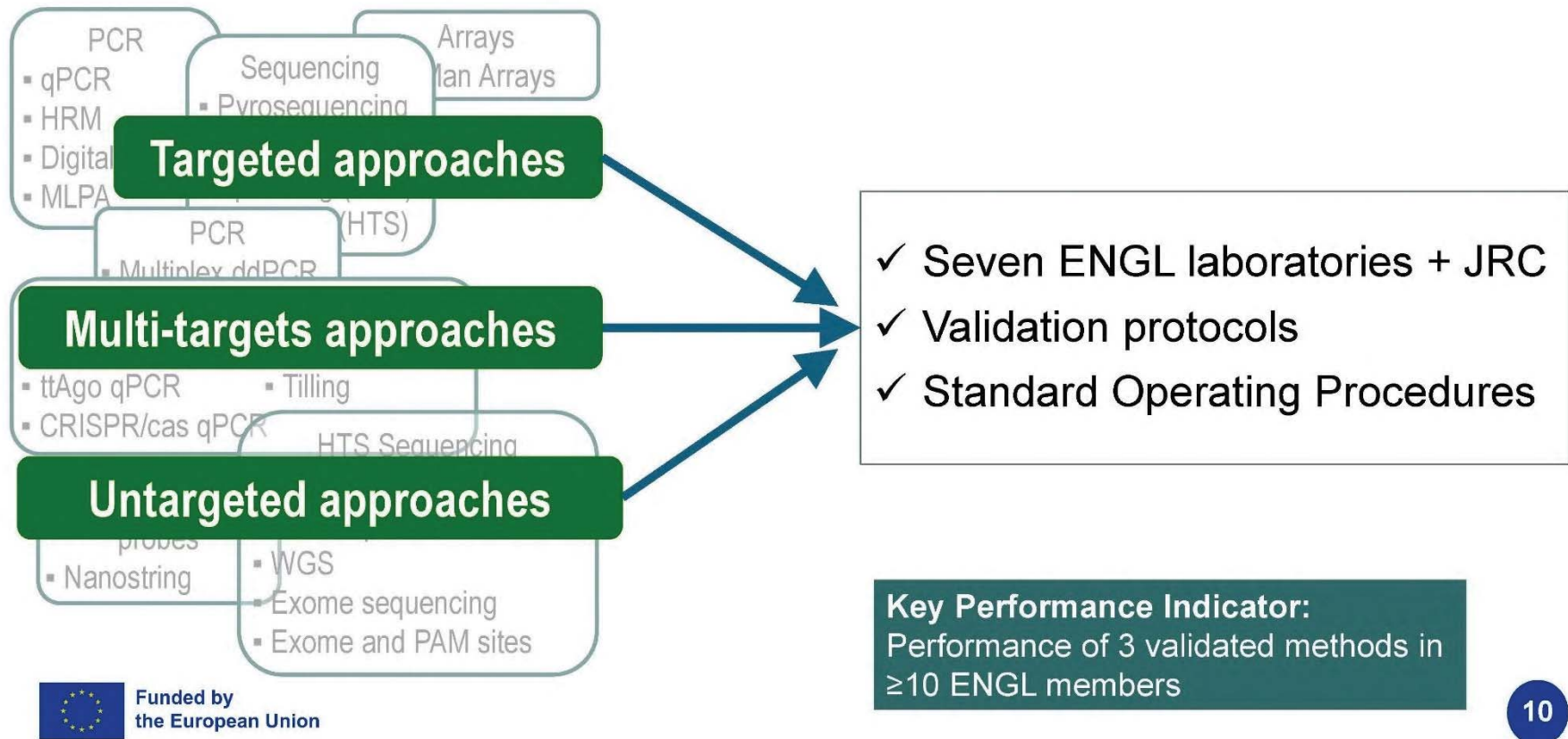
ML-based screening of sequence data to search for **stable classifiers** to differentiate NGT from non-NGT

Trained on modified and unmodified genomes

Sensitivity, specificity, accuracy and reliability



# Validation



## Regulatory implications

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- ✓ Analysis of the **legal prerequisites** for NGT detection methods and traceability approaches
- ✓ Application to the methods/approaches developed in this project  
>> **legal fit for purpose?**
- ✓ **Compare** to the regulatory solutions of 3rd countries

**Key Performance Indicator:**  
Regulatory implications described for  
≥4 different strategies for authenticity

## Socio-economic implications



- ✓ **Target indicators:** changes in trade volumes and market prices for the different commodities and countries covered by the socio-economic model.
- ✓ The model covers **eight regions and eight commodities**.
- ✓ In addition to that, economic implications will be expressed via changes in **social welfare indicators** such as producer and consumer income.



**Key Performance Indicator:**  
Socio-economic implications described for  
≥4 different strategies for authenticity

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## Socio-economic implications – Case studies

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✓ **Soybean and maize** supply chains

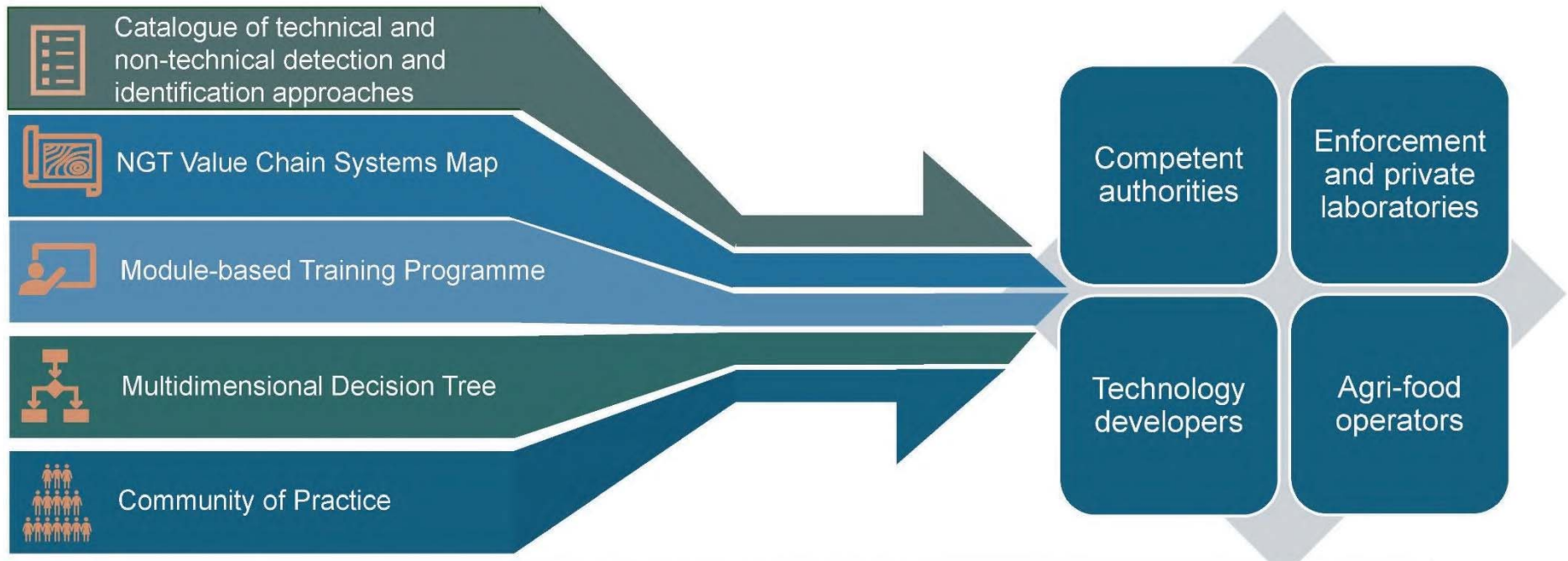
*Agricultural production, processing, transport, trade and distribution, manufacturing, retail and consumption at EU level*

- ✓ Analyzing the changes in quantity sold of non-GM crop and GM crop due to the **introduction of NGT crop**
- ✓ Analyzing the changes in the income of producers and consumers resulting from the implementation of **coexistence measures, labelling and traceability regulations on NGTs**
- ✓ Different scenarios depending on **governance options** will be considered

**Key Performance Indicator:**

Costs and benefits for alternative legislations addressing NGT identification assessed for two case products (maize and soybean)

# Empowerment



**Key Performance Indicator:**  
Decision-tree in use by  $\geq 20$  different individual stakeholders;  $\geq 45$  stakeholder members of CoP and in empowerment initiatives

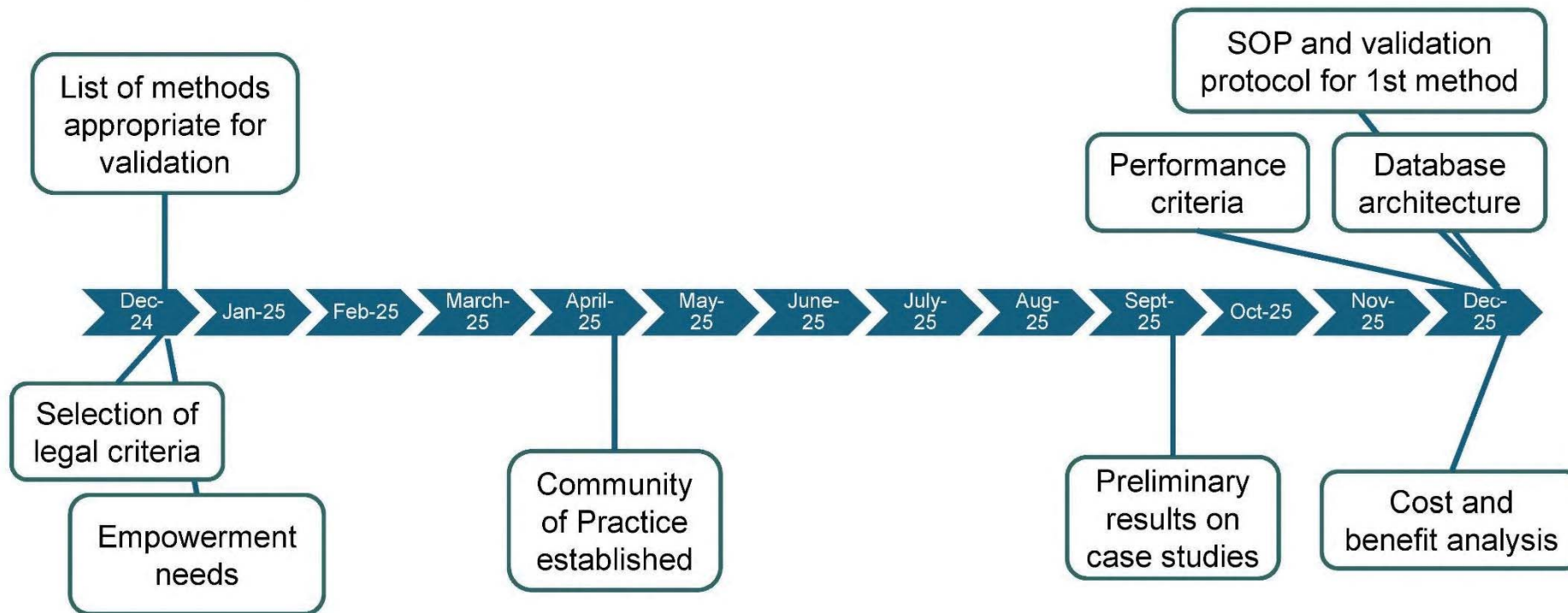
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# Upcoming milestones in 2025



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Thank you for your attention !



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