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LIVeseed



A toolbox for description and identification of heterogeneous material

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The starting point – 2014/150/EU

Article 1

Subject matter

2. The following elements shall be assessed:

- (a) whether the identification of populations of those species can take place on the basis of information on their breeding and production methods, the varieties used in the crossing, and the main characteristics of those populations; and
- (b) whether the identity of seeds from those populations marketed can be based on traceability requirements and identification of the region of production.

Alternatives to DUS

'Certified traceability'

From Article 2 "Scope"

Populations = plant groupings that result from a **given combination** of genotypes; ...considered as **units with regard to their suitability for being reproduced unchanged** once established in a given region of **production** with specific agro- climatic conditions; ...generated by...

- Crossing **>5 varieties** and **bulking progenies**
- Growing together **>5 varieties** of cross-pollinated spp. and **bulking the progeny**
- Inter-crossing varieties with other methods to produce a population that **does not contain varieties**



Definition
'population' ≠ 'variety'

Identification – 2014/150/EU

- Article 5
 - Parent germplasms
 - Breeding scheme
 - Region of production
 - Degree of heterogeneity
 - **Characteristics (Article 7 (2)(f))**

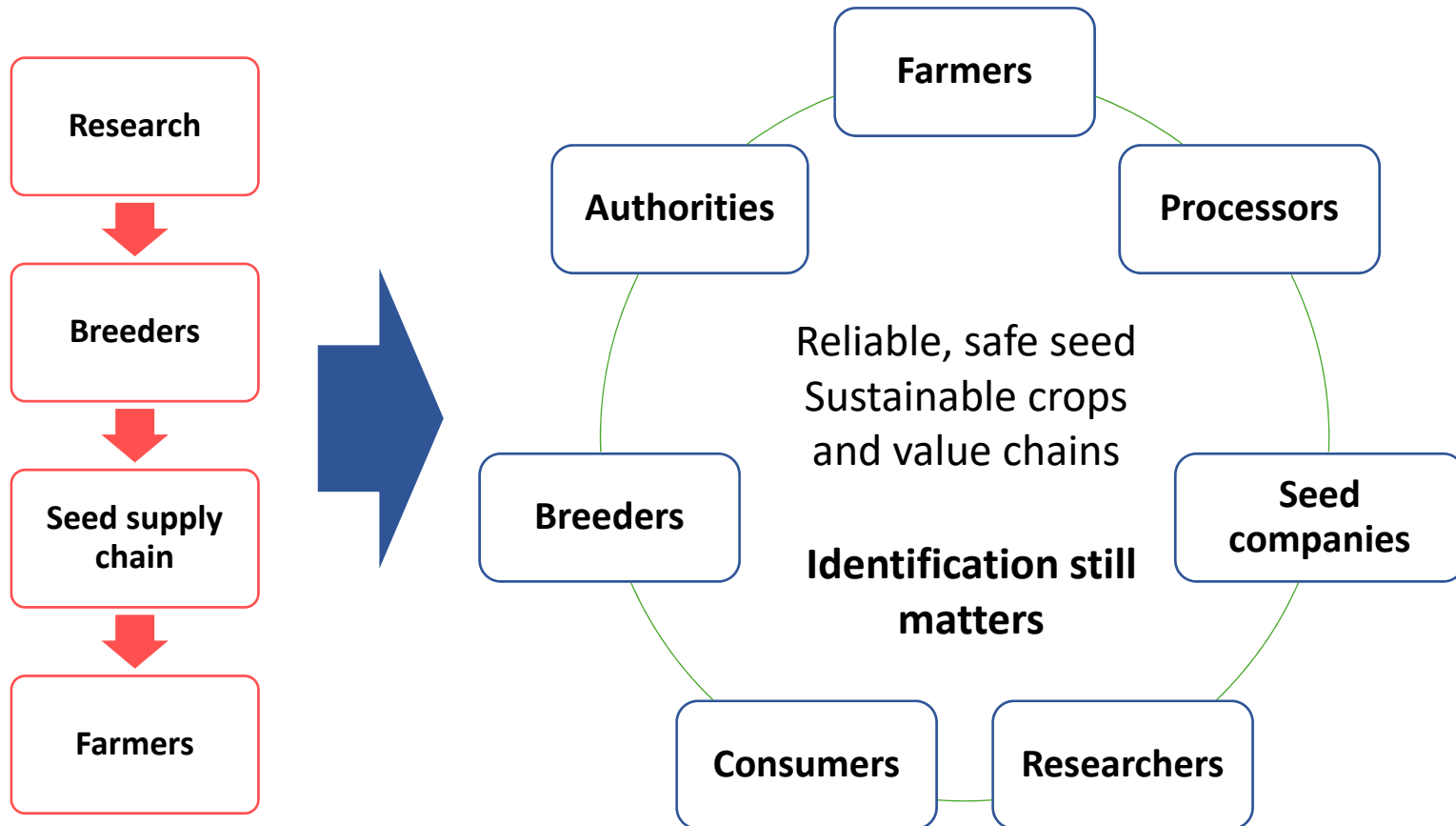


(f) a description of its characteristics:

- (i) documentation of its characteristics which the applicant considers as important as regards yield, quality, performance, usability for low input systems, disease resistance, yield stability, taste or colour;
- (ii) experimental trial results concerning the characteristics referred to in point (i);

Achievement of 2014/150/EU:

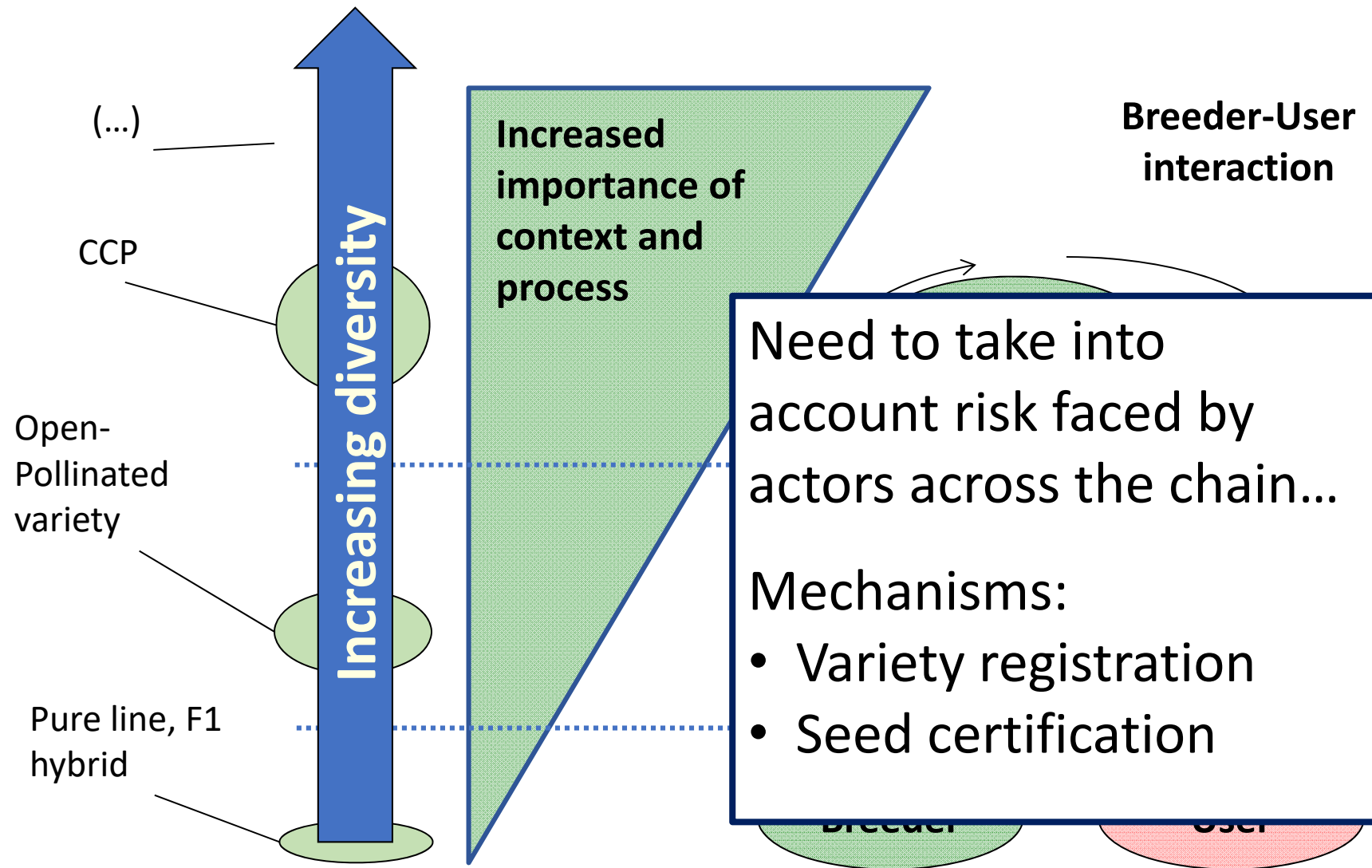
Multi-actor, inclusive and highly innovative seed-to-product value chains enter an official seed market alongside mainstream linear seed systems.



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Reviewing progress

- Challenges with traceability – what can provide a back up if ID is not possible?
- Separating seed identity from population identity (when DUS is not possible)
- Preventing ‘parallel market’ – considering when the market grows
- Toolbox for ‘population description and identification’
 - Different tools to address different challenges



Tools for the toolbox

Identification (Art. 5)	Population authorisation (Art. 7)
	Species and denomination
Parent germplasm	Breeding objective(s)
Breeding scheme	Breeding and production methods (selection)
Region of production	
Degree of heterogeneity	Description of how the population was generated e.g. 5 parent CCP
Characteristics (trial results)	Characteristics (trial results)
	Representative sample
	Applicant details and declaration

For Organic Heterogeneous Material this will be certified



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Does this provide information of use and interest?



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Based on performance (etc) as outlined in Article 7 (2)(f)



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Can this provide a back up? How about when a population evolves?



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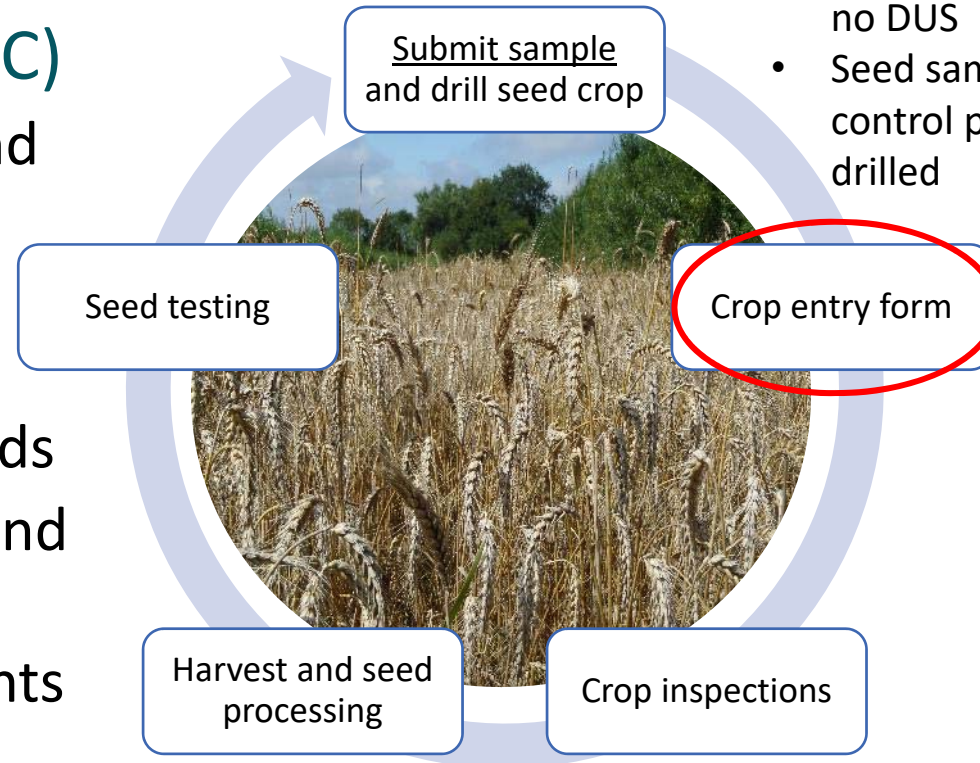
It is a legal document and applicants will be committing fraud if they provide false information



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- **Seed certification process (Directive 66/402/EEC)**

- Sufficient identity and varietal purity
- Diseases lowest possible level
- Seed quality standards
- Compliant seed lot and sample weights
- Labelling requirements
- Compliance with ID standards (Art. 5)



Notify authority:

- not a variety = no DUS
- Seed sample: a control plot is drilled

Region of seed production (can also tell us about ongoing selection environment)

- Seed certification ensures:
 - Traceability (will also be given by organic certification)
 - Seed safety and quality standards
 - Identification of region of production for the seed lot(s)
- “Compliance with the **identification requirements** of Article 5 shall be concluded on the basis of **submitted documentation** and **inspections** in the premises where the population is produced.”
- Varietal information generally being overlooked
- What does ID deliver anyway?
 - Characteristics/trial results can tell us about performance but are not checked via DUS
 - Whose interests are the processes serving?

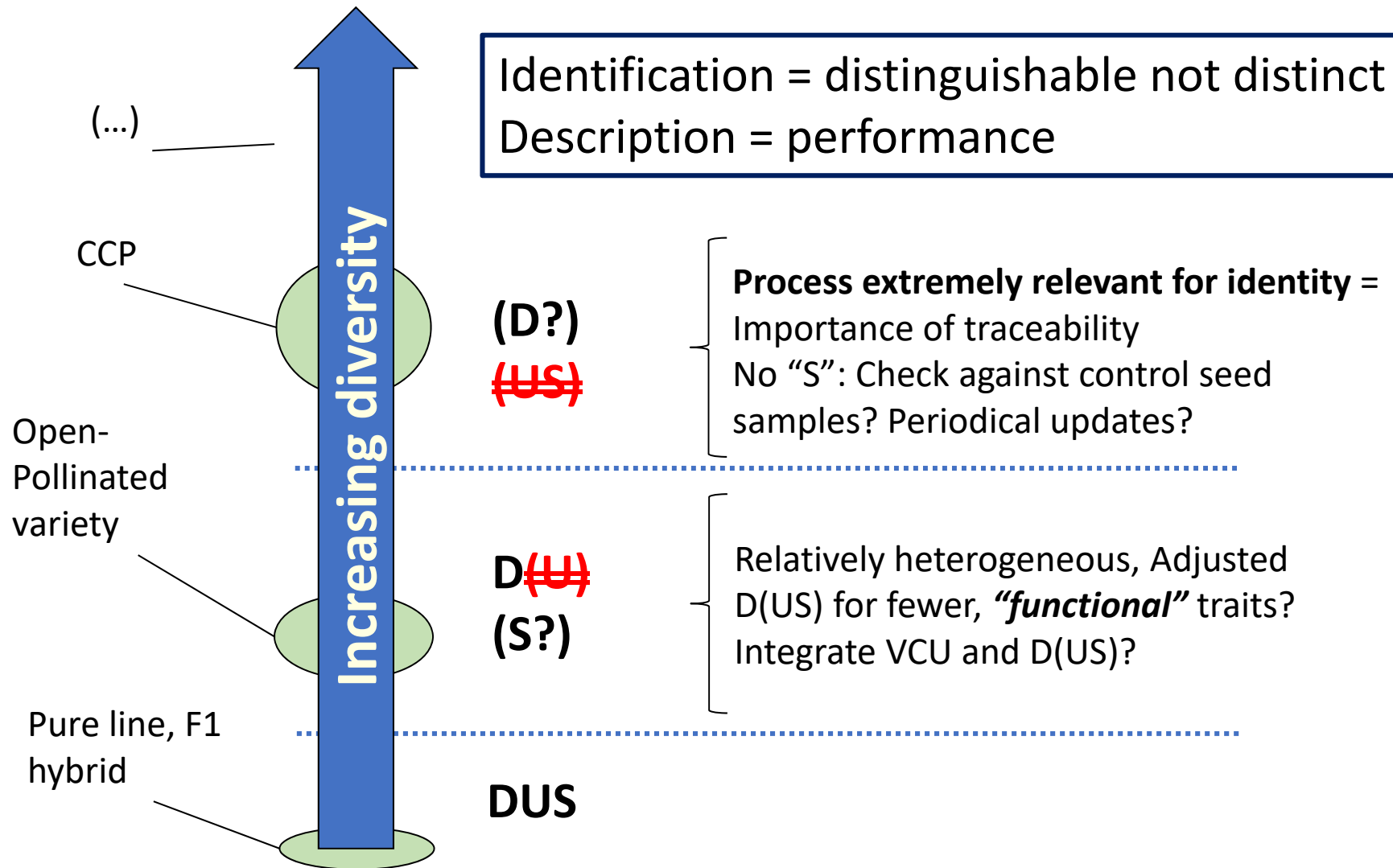


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Adjustments to be made

- Sticking points
 - Sufficient identity/'varietal purity' (back up to paper work?)
 - Region of production for population ID shouldn't be based on arbitrary borders
 - Degree of heterogeneity – how is it measured and what is its purpose? Will current definition be restrictive if adopted more broadly?
- What's missing (maybe)?
 - Trait frequencies – to support ID and provide details on heterogeneity
 - Performance monitoring
 - Registration committee & open description





Next steps

- Broadening scope
 - Definition of HM to include different crops
 - Different 'degrees of heterogeneity'
- Adding clarity to terms and processes for tool use
 - For example, region of production
- Gathering evidence on distinguishable features
- Producing a decision tree for what tools are most appropriate to address different challenges in different crops
- Validated protocols for the release of heterogeneous populations (LIVESEED D2.4, Nov 2020)



Questions for discussion

- Are the tools presented useful in formation of a system for description and identification of HM?
- Do you think there is anything missing?
- Are there any clear problems with the tools from your perspective?
- Thoughts and ideas on how to implement – can we make a diversity of approaches for diverse material a reality?



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