Organic heterogeneous material – opportunities and challenges

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Important to have a wide range of species & cultivar types that are adapted to variable growing conditions and the demands of different value chains.

Harnessing diversity
ORC’s Experiment in heterogeneous material:  
– An example of diversity-driven resilience

**ORC Wakelyns Population**

**Composite Cross Population ≠ Mixture of Varieties**
– “YQ mixture” would be 20 fixed types growing together
– “YQ CCP” is the **bulk progeny of 107 different crosses**, each generating a diversity of types
Evidence of resilience
Particularly under stressful conditions

“Normal” situation (early sowing)
“Stressful” situation (late sowing)
The starting point – 2014/150/EU

**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**

**Alternatives to DUS**

- **‘Certified traceability’**

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**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**.

**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);
Increased importance of context and process

Breeder-User interaction

- Open-Pollinated variety
- Pure line, F1 hybrid
- CCP

Breeder

User

Breeder

User

LIVESEED

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Increased importance of context and process

Breeder-User interaction

Need to take into account risk faced by actors across the chain...

Mechanisms:
- Variety registration
- Seed certification

(...)

CCP

Open-Pollinated variety

Pure line, F1 hybrid
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
Different tools for different tasks

- **CCPs**
  - Self-pollinating
  - Cross-pollinating
  - e.g. breeding and production methods

- **OPV**
  - Self-pollinating
  - Cross-pollinating

- **Synthetic**
  - Self-pollinating
  - e.g. origin, region of production

- **Landrace**
  - Self-pollinating
  - Cross-pollinating

Common requirements e.g. performance guarantees, seed quality (seed certification and organic production provide traceability)