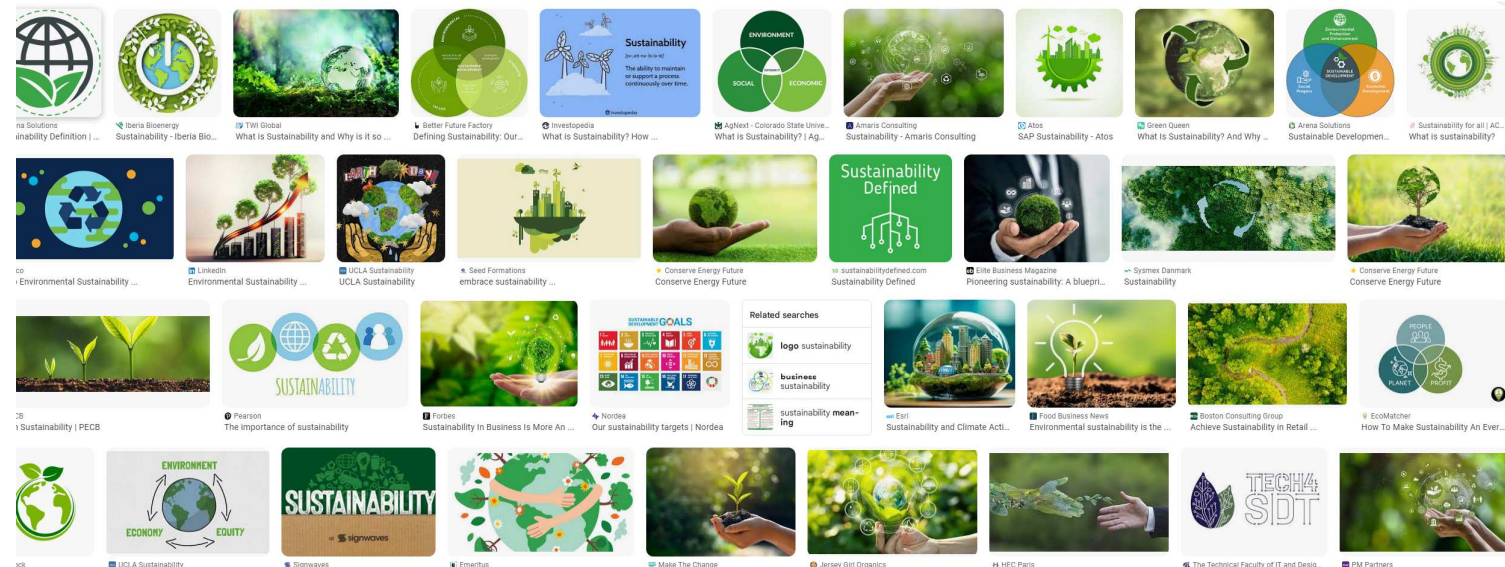


# EU PRM – proposal – July 2023

## Article 52 "VsCU"

### Value of sustainable Cultivation and Uses VCU-experts' meeting 14-05-24

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## Article 52 – Commission PRM-proposal

### Value for sustainable cultivation and use

1. For the purposes of Article 47(1), point (c), the **value** of a variety for **sustainable cultivation** and **use** of a variety shall be considered as satisfactory if, compared to other varieties of the same species registered in the national variety **register of the respective Member State**, its characteristics, taken as a whole, offer a clear improvement for the **sustainable cultivation** and **the uses** which can be made of the crops, other plants or the products derived therefrom.

The characteristics referred to in the first subparagraph are the following, **as appropriate for the species, regions, agro-ecological conditions and uses** concerned:

- a. yield, including **yield stability** and **yield under low-input** conditions;
- b. tolerance/resistance to **biotic stresses**, including plant diseases caused by nematodes, fungi, bacteria, viruses, insects and other pests;
- c. tolerance/resistance to **abiotic stresses**, including adaptation to climate change conditions;
- d. more **efficient use of natural resources**, such as **water and nutrients**;
- e. **reduced need for external inputs**, such as plant protection products and fertilisers;
- f. characteristics that enhance the sustainability of **storage, processing and distribution**;
- g. quality or nutritional characteristics.

Traits justifying the incentives referred to in Article 22 of NGT regulation

**Incentives for category 2 NGT plants and category 2 NGT products containing traits relevant for sustainability**

1. yield, including yield stability and yield under low-input conditions;
2. tolerance/resistance to biotic stresses, including plant diseases caused by nematodes, fungi, bacteria, viruses and other pests;
3. tolerance/resistance to abiotic stresses, including those created or exacerbated by climate change;
4. more efficient use of resources, such as water and nutrients;
5. characteristics that enhance the sustainability of storage, processing and distribution;
6. improved quality or nutritional characteristics;
7. reduced need for external inputs, such as plant protection products and fertilisers.

How to implement VsCU meaningful across species and growing conditions?

Workshops with applicants :

- Cereals 8-11-23
- Pulse and oil and fiber plants 7-2-24
- Grasses and maize 8-2-24
  
- Beets and potatoes still to come



## Cereals :

Generally a high degree of satisfaction with the integration between National Listing and post registration trials (PRT)

- Varieties are monitored after registration
  - Tough selection
    - National Listing
    - PRT: Landsforsøg – yield – disease susceptibility (observation plots)
    - SortInfo - documentation – technical transparency  
=> multiplication – sale
    - Observation plots identify changes in susceptibility of individual varieties and new emerging plant diseases under Danish growing conditions
  - Continuous exchange of varieties ensures genetic adaptation (climate/growing conditions/policy)
- Examination and evaluation based on Danish conditions
  - Growing conditions simulating practical farming
- Economically acceptable cost of examination

But – still further possibilities

- Review af testing protocol
- Obligatory A+ (+/- fungicid/respons) of varieties in the 2nd year of testing
- Scout/mine in existing data/trials
  - Parameter for yield stability
  - IPM-score by variety for all species (presently only winter wheat)
  - Parameter for nitrogen use efficiency (NUE)
  - Reality-check on e.g.
    - Pesticide use –
      - Comparison between member states
- Disease assessments when treated with fungicides
- Climatic data on every testing location
- Co-operation with other countries on
  - Methodology
  - Parameters independent of the environment (eg specific-resistances or quality evaluation)
- Index contra technical evaluation

## Pulses – (peas, broad beans and lupins) – possibilities:

- Species contain plenty of sustainability aspects both in relation to growing and possibilities as plant based food 👍
- Disease registrations – especially downy mildew of legumes (*Peronospora viciae*) in broad beans
  - co-ordinated and qualified assessments – preferably comparable to observation plots of cereals
- Species of pulses are susceptible to early spring drought, due to this we need further information regarding every trial location as
  - Climatic data with a calculated drought profile - precipitation deficit combined with
    - Date of sowing/drilling
    - Flowering
    - Maturity
    - Harvest
- No seed treatment
- No fungicides in testing
- Sowing/drilling with the possibility of mechanical between row cleaning – lesser herbicides
- Agricultural - contra vegetable segment – “intended use” definition
- Lack of research on many aspects

Oil and fiber crops – mainly – winter oil seed rape – possibilities:

- Good trials – valid results
  - More focus on NUE – especially when using animal manure
- NUE – via reduced N-application (8-12-14% below official norm)
  - Promote NUE varieties
  - DK WOSR equals "extensive growing conditions"?
- No seed dressing
- Limited use of fungicide treatment during testing
- Disease registrations – co-ordinated and qualified as observation plots of cereals



## Maize – status – possibilities

- Testing identifies weak varieties => testing identifies varieties optimized to the farming practice
- Include A+ testing in the 2nd year of VCU-testing – further testing in 2nd year of examination
- 1-2 trial locations where the varieties are grown with a catch crop (EU/DK- political growing requirement)
- N-balance – identify NUE-varieties
- Irrigation at e.g. 100 mm deficit
  - Drought stress varieties with limited damage to the whole trial
- Harvest according to the physiological maturity of every variety – nearly impossible

## Grasses:

- Varieties in pure stand with max N-application to ensure good and valid results
- N-balance/varieties as applied/harvested (NUE)
- Focus on yield and quality assessment in 2nd and 3rd year of use
- Climatic data by trial location – drought profile with possibility to identify drought stressed cuts/swath and giving them a higher weight
- Disease assessments at low N-level (stressful conditions)
- Research: Interaction between clover and grass species
- Include data of applicants pre-registration trials
  - Definition of requirements as reference point, management including N-application, years of use, monitoring/supervision of applicants trial
  - Increased amount of data regarding yield stability
- Date of heading recalculated to days of temperature development
- Heterogeneous varieties/populations with a magnitude of applications
  - Clear definition of "intended use" at the time of application

## **Common considerations across workshops:**

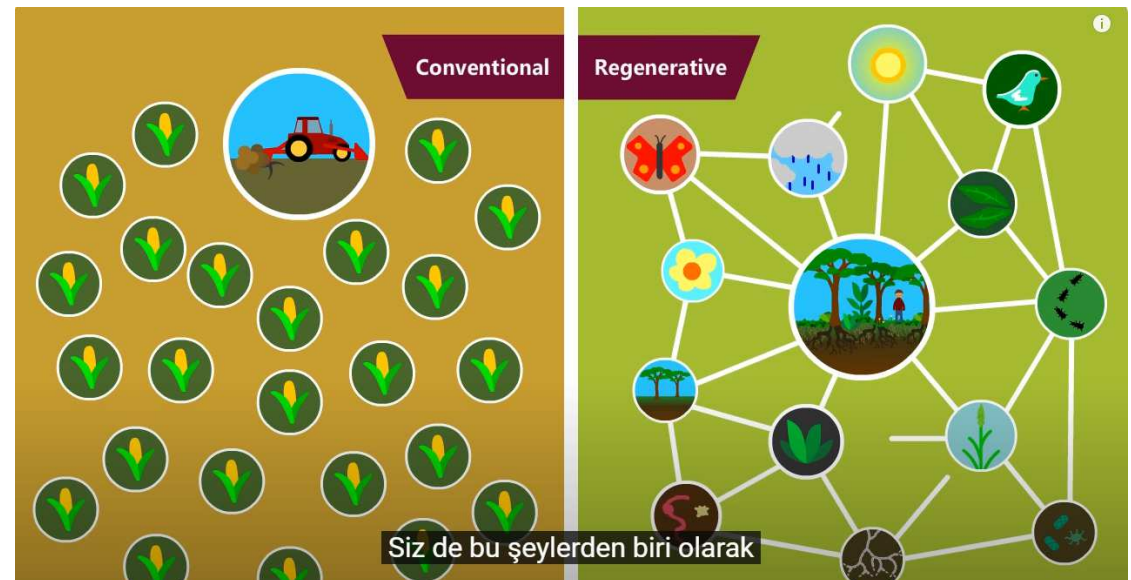
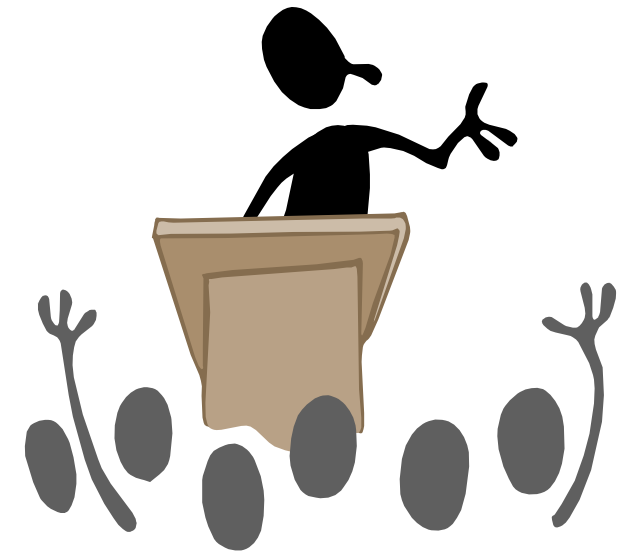
- Good valid trials – top priority
- Accessible trial results – sortinfo – farmers decision system
- Interface between variety testing – research
- Costs
- Co-operation with applicants and other authorities/institutions
- Stability across testing environments – additional testing environments in the 2nd year of testing (DK: A+ trials)
- Focus on NUE
- Intensified monitoring of trial conditions – weighting of specific parameters, e.g. drought stressed cuts/swath in grasses

## Black boxes

- Delegated acts – Commission empowered
- Control Regulation (CR)
- National testing network contra applicants involvement– positive, in case of species with few applications
  - Or – threat by
    - Degrading of existing testing network
    - Cost will rise by having parallel testing networks
    - Sustainability -
      - One European definition across member states, species and growing conditions ?
      - VsCU - Intended use – future application of variety – to be clearly defined at the time of application
- DUS – optimal growing conditions to ensure comparable evaluation among registered varieties and candidate varieties
- Legal expectations
  - to what extend can the technical work deliver on the legal expectations

Questions–comments – later, please

- Sustainability
- Regenerative agriculture, like
  - No till farming
  - Regenerative grazing
  - Agro forestry
- Resilience – Nachhaltigkeit – robust plant material
  - Agricultural challenge
  - Improved genetics – adjusted management – develop natural/biological/agricultural mechanisms/processes
- others?
- [Carlsberg – regenerative](#)
- [KWS sustainable](#)





## Specifikke aspekter – GDE noter

- Sortsdifferentiering – hvad kan måles eller giver mening
- Scoute i eksisterende afprøvning/resultater
- Ukrudtskonkurrence – kløver tolerance
- Niveau af fungicidbehandling – mere plads til genetik
- Udbyttestabilitet – CV af fht som parameter på tværs af miljøer
- Proteinudbytte
- Yield under low/high input
- Resilience – Nachhaltigkeit
- Snitflade mellem forskning og afprøvning
- Sortsspecifikke undersøgelser
- Differentieret N-tildeling

## Sustainability aspect in VCUS-testing

- Sustainability = Higher priorities on optimization of
  - natural resources
  - agricultural production
- EU-Commission: eg disease resistance – or low susceptibility against pathogens
- Variation in sustainability assessment depends on species \* type of use with yield evaluation based on the following yield components
  - $Y = E * G * R_i * (p)$ 
    - E = Environment = Soil, Temperature, Rainfall – environment
    - G = Genetics = genetic ability/possibilities/potential (VCU-DUS)/mixtures etc
    - $R_i$  = Resources/input factors = Fertilisers, Herbicides, Fungicides & Insecticides, artificial irrigation, water, heat etc
      - variable in use
      - some uncontrollable
      - unlimited amount of financial resources
  - (p) = political aspects, eg. lowering of N-application, ban on pesticides, demand for cover crops etc
    - how to optimize
    - national adaptation of VCU-protocols (subsidiarity) balanced against EU-requirements
  - IPM-principles where genetics can affect the result
  - Authority \* breeder co-operation – external input into evaluation



- Stability evaluation of key parameters across testing environments
  - Evaluation of variation across testing environments
- Access to trial data
- VsCU- Quality management – perform valid and stable trials
- Reference varieties from neighbouring countries – border regions
- Results of Innovar/Invite
  - Innovar
    - Objective: Identify HPLR-varieties including evaluation
    - Danilo Sarto "Machine learning and genotype by drought interactions"
  - Invite
    - Daniel Traon "Results applicable to VCU-testing"
    - Boris Parent "Characterise varieties for their resilience to heat and drought stress"
  - VCU-testing network
    - Fabian Masson "heat and drought stress", FR
    - Poos Bernat "VCU drought evaluation in 2022", HU
    - Levy&Pellet "Sustainability in wheat", CH
  - Radimax evaluation

- After approval continued monitoring of aspects, where there is a variation between varieties (post registration testing), especially
  - yield testing and
  - disease susceptibility
    - updated and actual information available to users/farmers
- EU-CC paradox – national registration of one member state gives access to EU seed marked of all member states, although growing conditions vary considerably across the EU (water/heat/pathogens etc)
- Storing and maintaining genetic material after expiry of national listing/PBR
  - Automatic transfer of plant material to Gene Banks

- Optimization of testing infrastructure
  - Testing in border regions – regional testing - chk
  - Reuse/share laboratory facilities eg
    - club-root assessment, nematodes, DUS testing, malting, baking, etc – chk
  - Artificial disease infection evaluation

## Climate change aspects

- Climate friendly varieties / classification?
- Varieties characterised regarding climatic adaptation?
- Method?
  - Index/score based on existing characters
  - Multifactorial designs
  - Low input trial series
  - Optimization of resources ? National testing infrastructure



1. Vi forebygger og bekæmper ukrudt, sygdomme og skadedyr ved flere metoder, navnlig ved:
  - at have et varieret og sundt sædskifte
  - at bruge hensigtsmæssige dyrkningsmetoder (god og rettidig etablering, passende udsædsmængde mv.)
  - at bruge resistente eller tolerante sorter, når det er muligt og bruge udsæds materiale af høj kvalitet
  - at gødske, kalke, vande og afvande i passende omfang
  - at forebygge spredning af ukrudt, sygdomme og skadedyr (omhyggelig rengøring af maskiner mv.)
  - at beskytte og øge mængden af nytteorganismer i og omkring det dyrkede areal
2. Vi kender og følger skadevolderne i afgrøderne, bruger varslinger og prognoser og søger råd hos kvalificerede og uvildige rådgivere.
3. Vi inddrager varslinger, prognoser og skadetærskler, når vi tager beslutninger om plantebeskyttelse. Desuden tager vi hensyn til regionale og klimatiske forhold.
4. Vi vælger ikke-kemiske metoder (biologiske, mekaniske, termiske mv.) mod skadevolderne, hvis metoderne er tilstrækkeligt effektive og rentable.
5. Vi vælger de pesticider, som passer bedst til opgaven og giver mindst risiko for bivirkninger på menneskers sundhed, på andre organismer i naturen og på miljøet.
6. Vi vælger den korrekte dosering, så vidt muligt nedsatte doseringer. Vi behandler så få gange som muligt, pletsprøjter mv. Samtidig forebygger vi, at skadevolderne udvikler resistens mod midlerne.
7. Er der risiko for resistensdannelse, forsøger vi at erstatte nogle af behandlingerne med midler med andre virkningsmekanismer, eller vi blander midler med forskellige virkningsmekanismer.
8. Vi følger op på, hvordan indsatsen har virket. Udgangspunktet er en løbende overvågning af skadevolderne i marken og registreringerne i sprøjtejournalen.