

Visual Gestalt evaluation of biocrystallization images

– ranking samples from different production systems

1. CuCl_2 - crystallization patterns
2. Status research
3. Aging and DOK
4. „analytical “<-> „ qualitative“ perception
5. Conclusion

Live + Quality?

Indicator live / food:

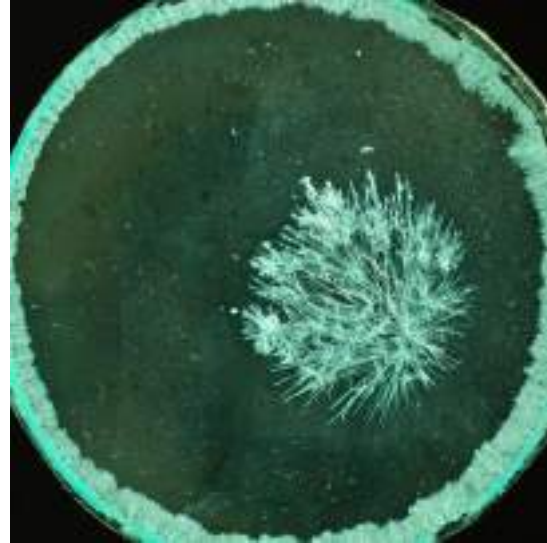
ingredient <-> form



biocrystallization

biocrystallization

CuCl_2
+ H_2O



+ plant juice
(wheat)



biocrystallization chamber



Documentation and characterization of the laboratory processes/ crystallization chamber

(Busscher et al. 2010a, Busscher et al. 2010b, Kahl et al. 2013)

Development of texture- and structure image analysis algorithms

(Andersen 1999, Doesburg & Nierop 2013, Meelursarn 2007)

Biocrystallization

Standardization and validation of the morphological visual evaluation based on ISO norms for sensory analysis

(Huber et al. 2010)

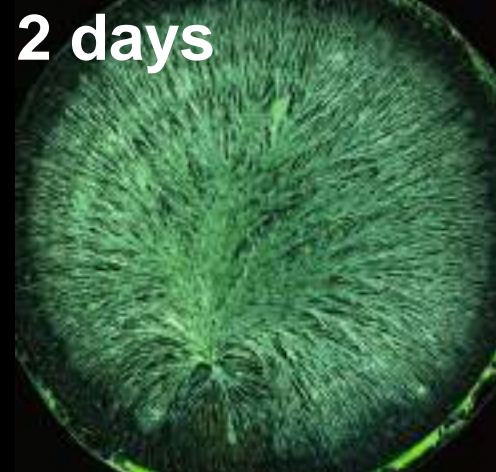
Standardization of a visual Gestalt evaluation based on the plant physiological processes of ripening and ageing

(Doesburg et al. 2014)

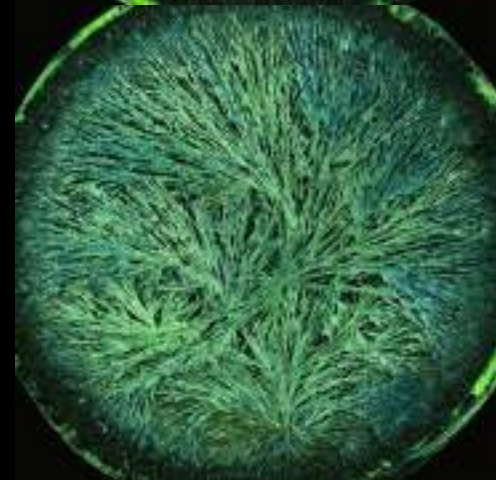
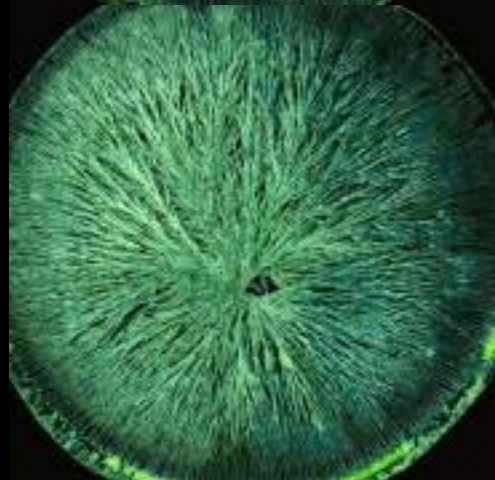
fresh

2 days

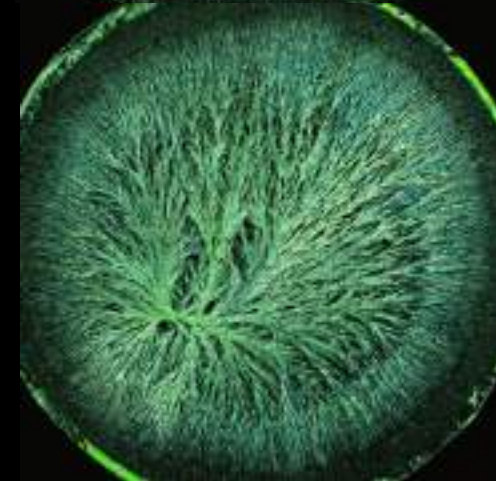
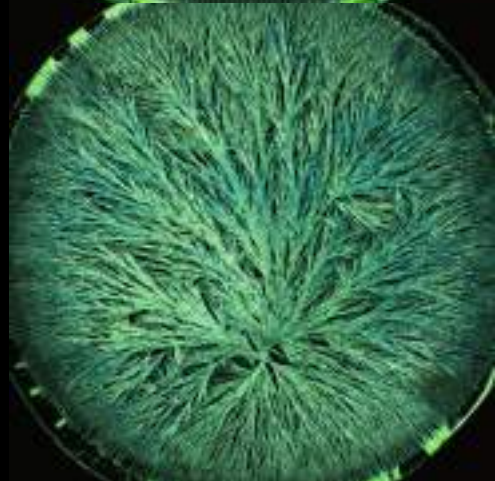
0.200 ml juice



0.175 ml juice



0.150 ml juice



Biodynamic 1 day



Biodynamic 2 day



Biodynamic 5 day



Organic 1 day



Organic 2 day



Organic 5 day



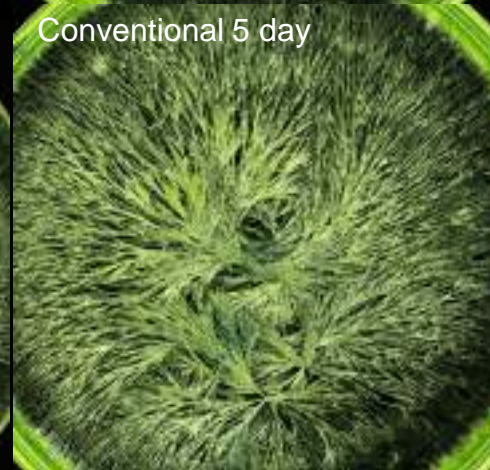
Conventional 1 day



Conventional 2 day



Conventional 5 day



grape juice 2010 0,200 ml

InBioDyn-trail Uni-Geisenheim

grouping coded samples with biocrystallization method

grape juice

2006 **D4 = D4** ; **D3 = D3** ; **O = O** ; **D0 = D0** ; **K = K**

2007 **D3 = D3** ; **O = O** ; **K = K**

2008 **D3 = D3 = D3** ; **O = O = O** ; **K = K = K**

2009 **D3 = D3 = O** ; **D3 = O = O** ; **K = K = K**

2010 **D3 = D3 = D3** ; **O = O = O** ; **K = K = K**

wine

Alterung/Degeneration (ageing) 

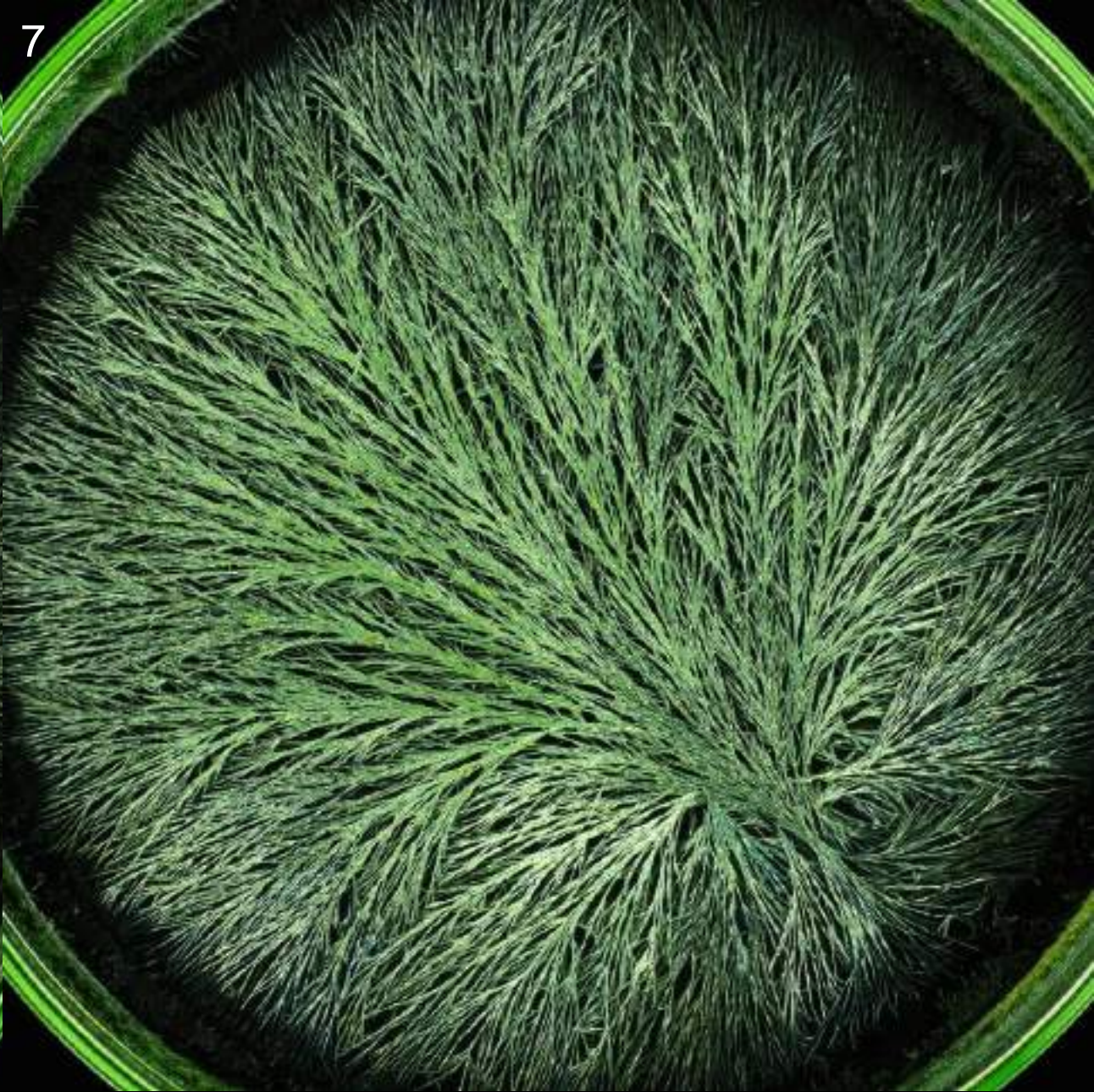
2010 **D3 = D3 = D3** ; **O = O = O** ; **K = K = K**

2012 **D3 = D3 = O** ; **D3 = O = O** ; **K = K = K**

Biodynamik: **D4= 4 x 501**; **D3= 3 x 501**; **D0= 0 x 501**

Organic: **O**

Conventionell: **K**



wine 2010 2 days 0,12 ml



wine 2010 2 days 0,12 ml



wine 2010 2 days 0,12 ml

4 Biodyamic



7 Conventional



wine 2010 2 days 0,12 ml

Evaluation levels

1. **Analytical perception:** Structure picture externally, morphological criterion
2. **Qualitative perception:** to settle in the quality picture from chest

-> **Subjectivity** → **more safety in evaluation** ?

Perception exercises on crystallization images of
differently aged grape juice samples





101.1

grape juice
-ageing-



101.2

101.1



101.2





101.1
5 days aged

grape juice
-ageing-



101.2
fresh



102.1

grape juice
-ageing-



102.2

102.1



102.2





102.1
fresh

grape juice
-ageing-



102.2
5 days aged

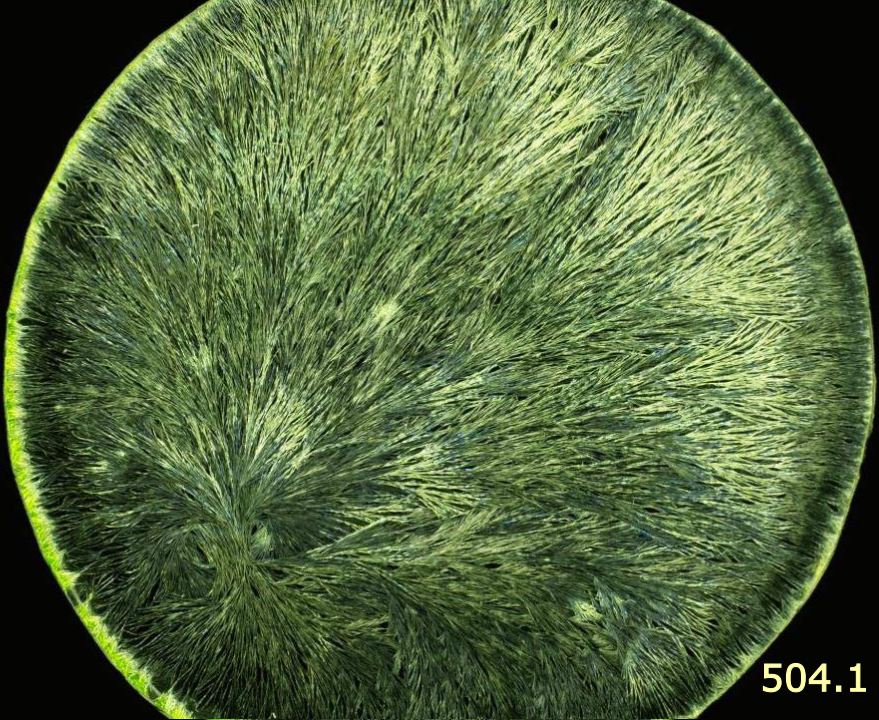
Perception exercises on crystallization images
according to ageing criteria with different
cultivation methods of grape juice

Biodynamic

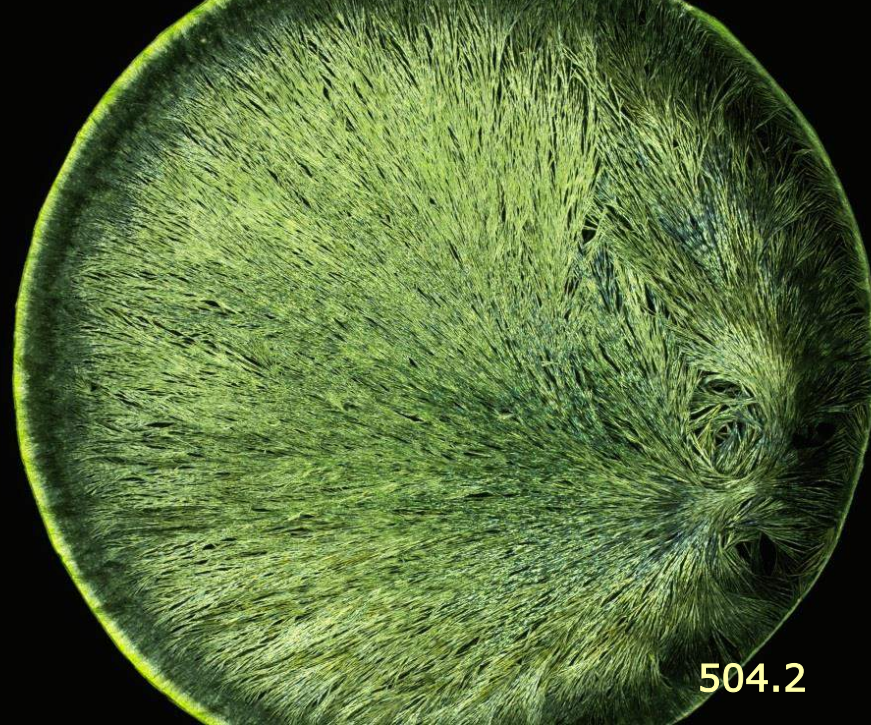
Organic

Conventional

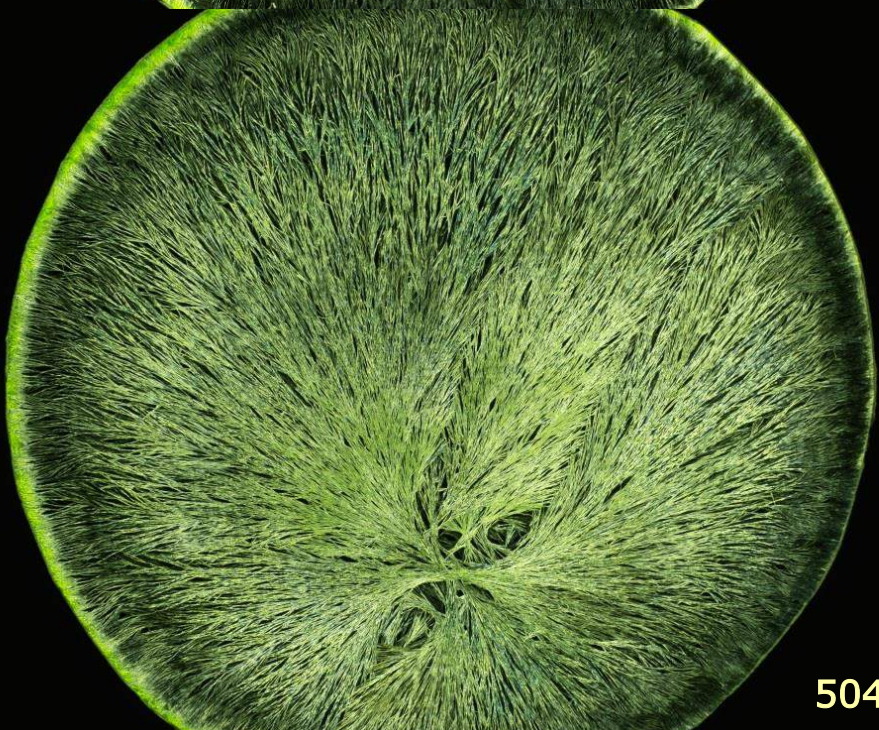




504.1



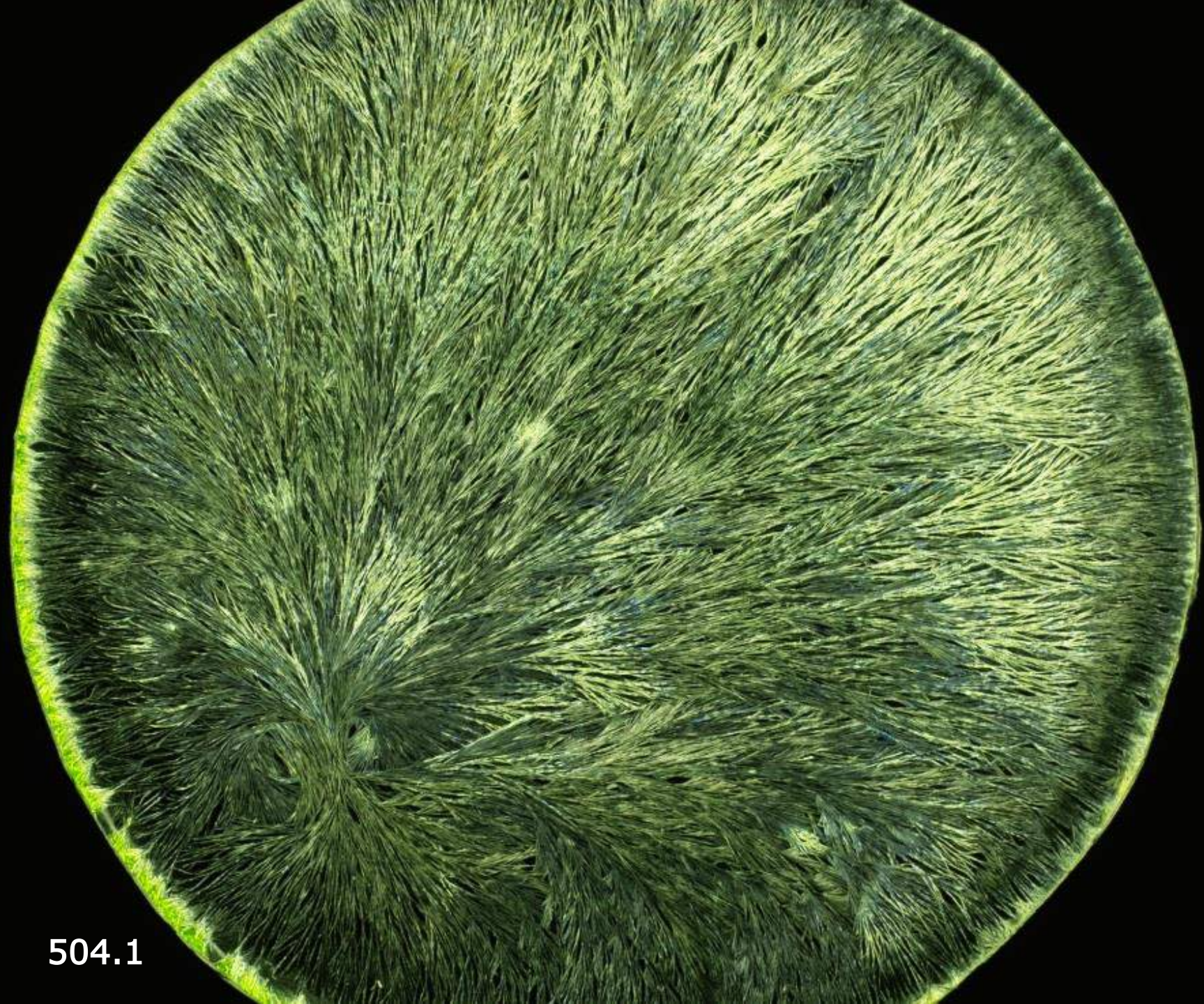
504.2



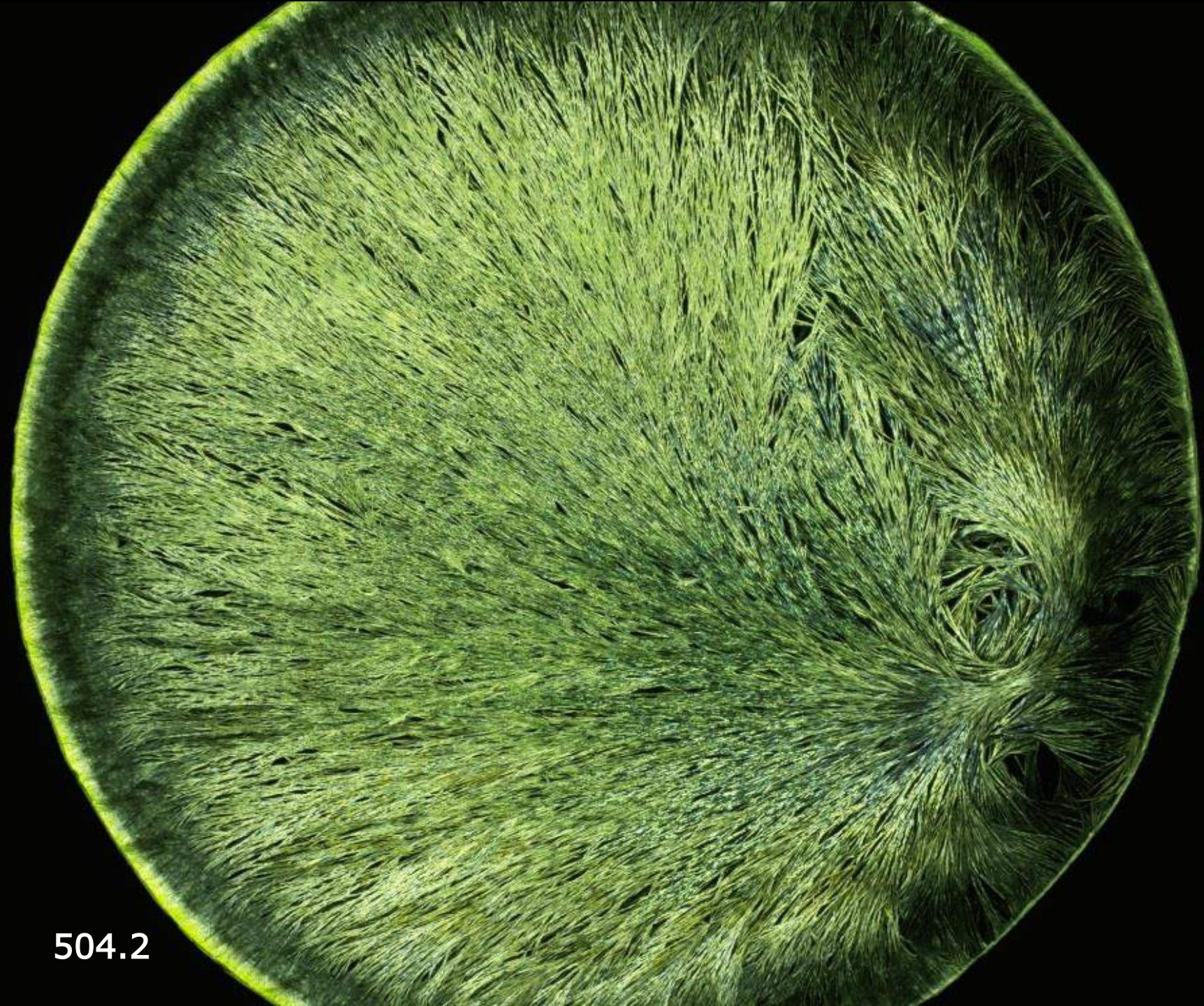
504.3

Demo Dyn \leftrightarrow Bio

grape juice



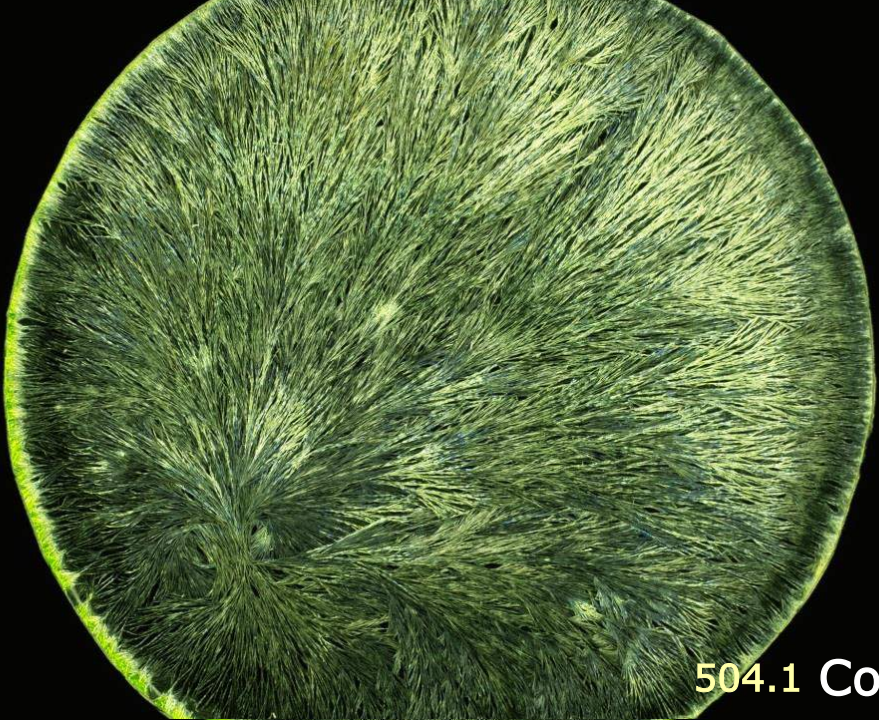
504.1



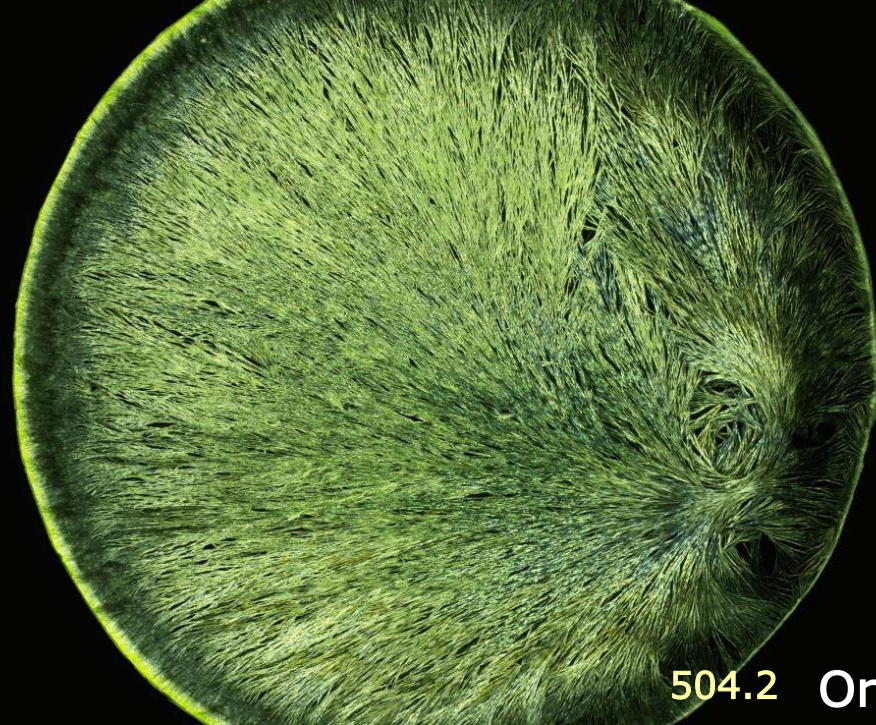
504.2



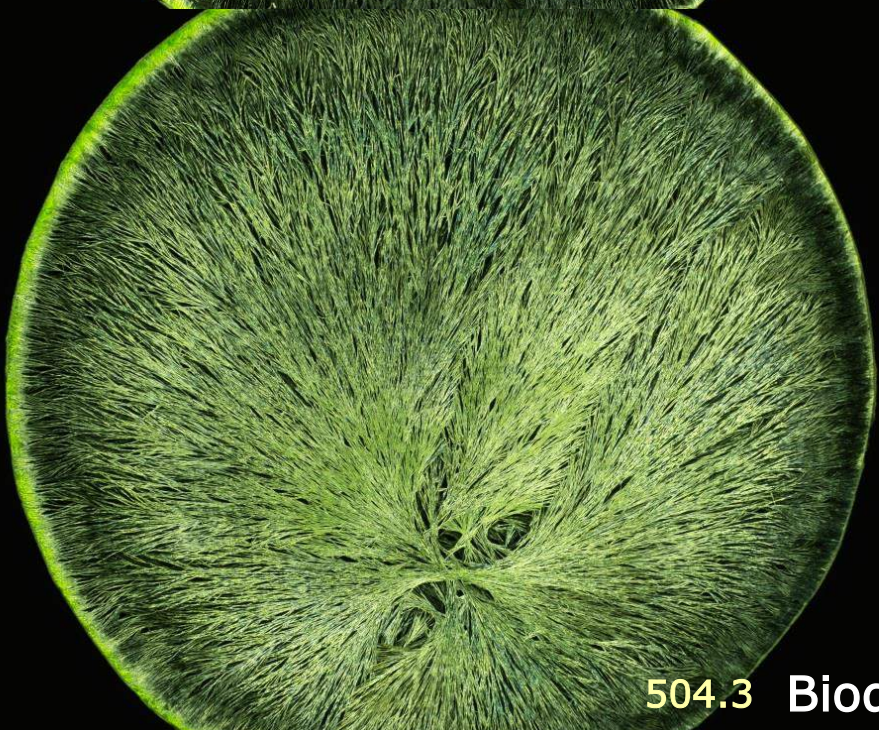
504.3



504.1 Conv.



504.2 Org.



504.3 Biodyn

grape juice

Evaluation levels

1. **Analytical perception:** Structure picture externally, morphological criterion
2. **Qualitative perception:** to settle in the quality picture from chest

-> **Subjectivity → more safety in evaluation!**

Qualitative perception – process (Goethe):

-> clear and sober description of the samples

1. „To Look New“ / „Neu Hin-Sehen“ -> example

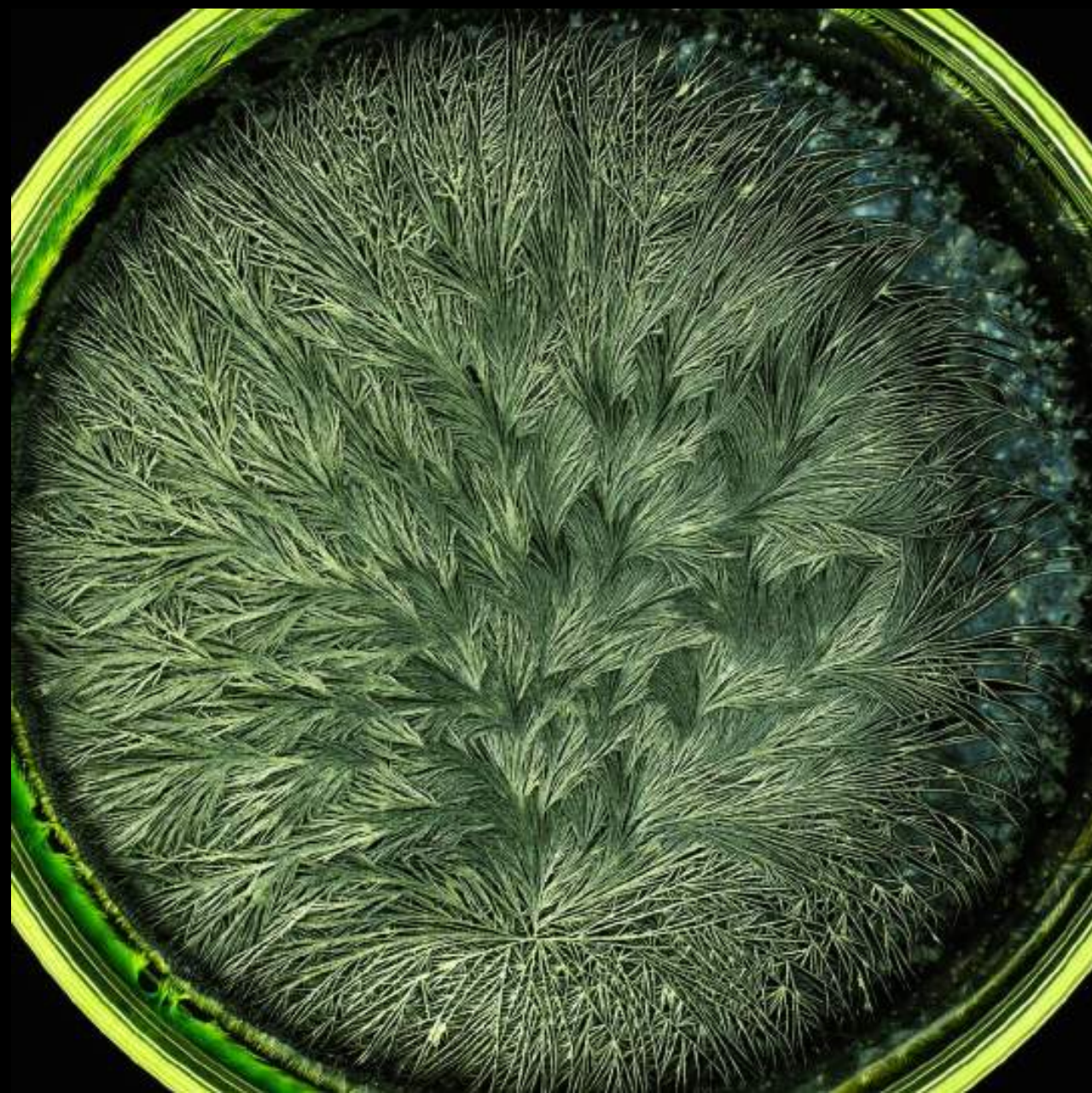
2. Empathy / „devotional amazement“ / „hingebungsvolles Staunen“







1 x 500



3 x 500 + 3 x 501









3 x 500 + 3 x 501



1 x 500



Conclusion biocrystallization:

-> Classification DOK possible

-> Analytical <-> qualitativ perception

Sulphur application / Filtration

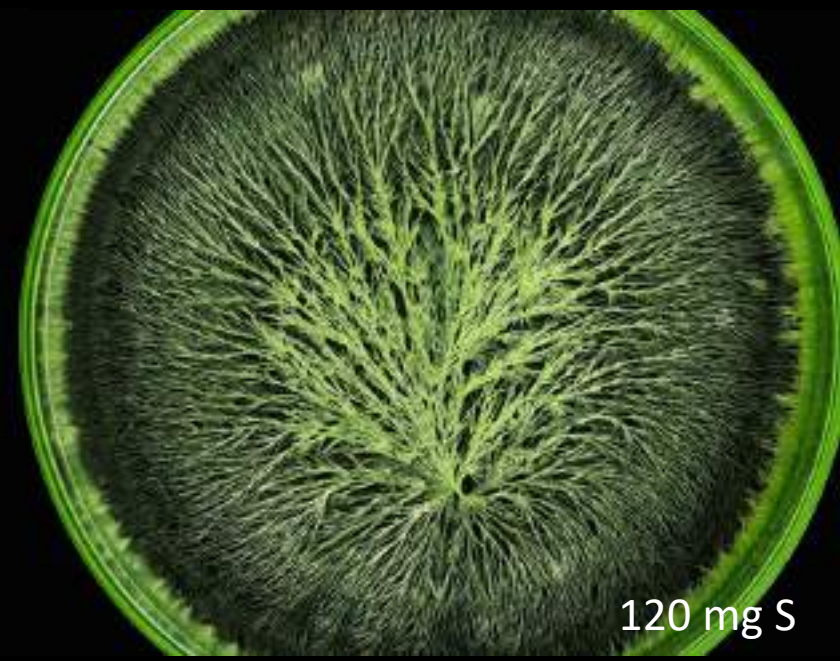
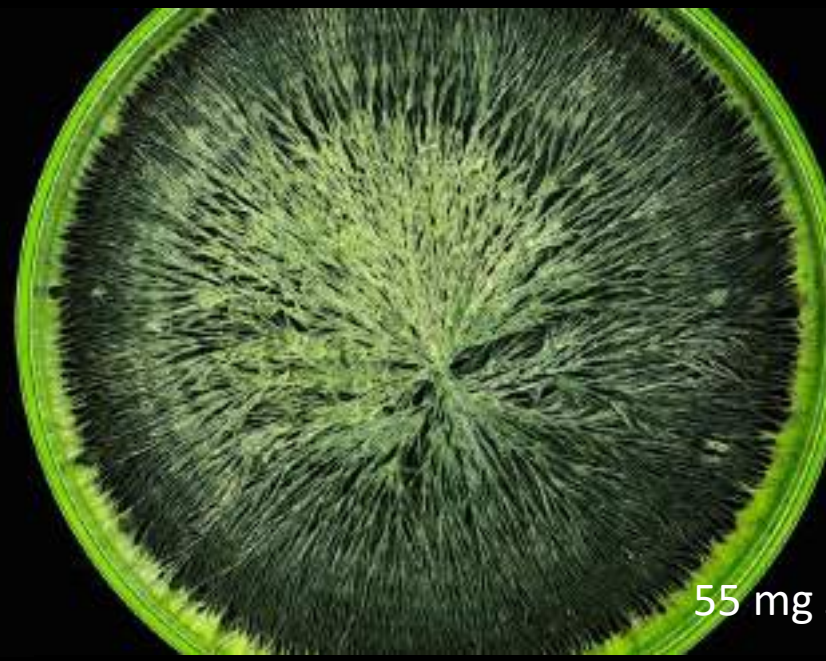
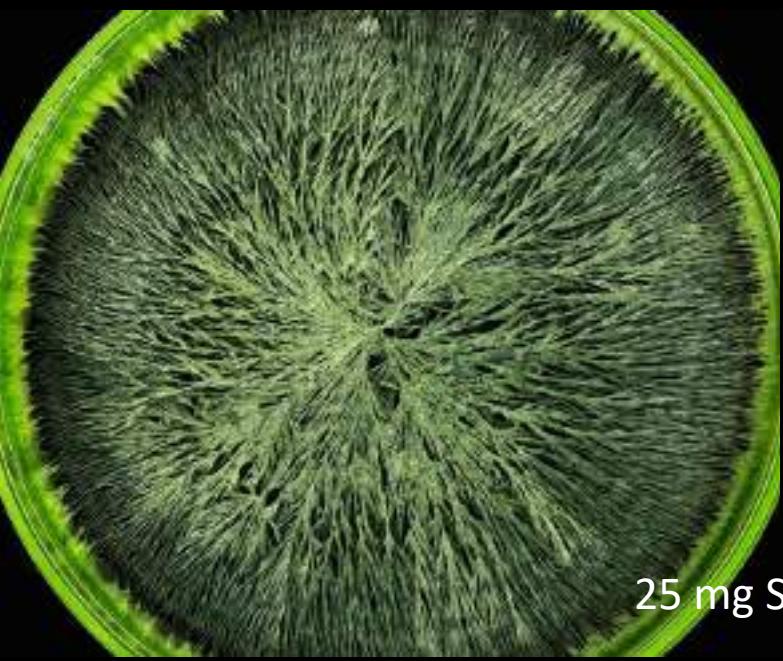
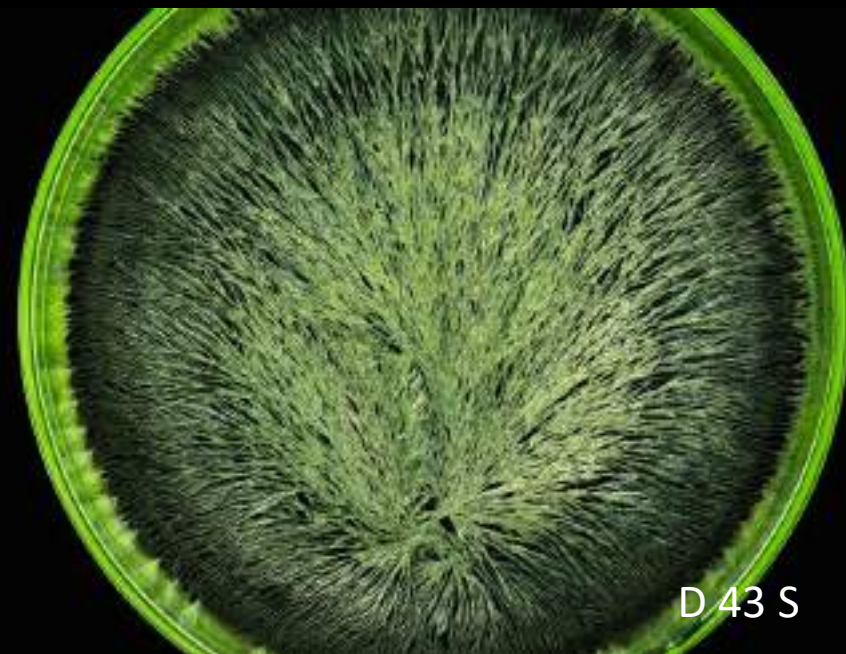
sulphur application wine 0 days bottle opening



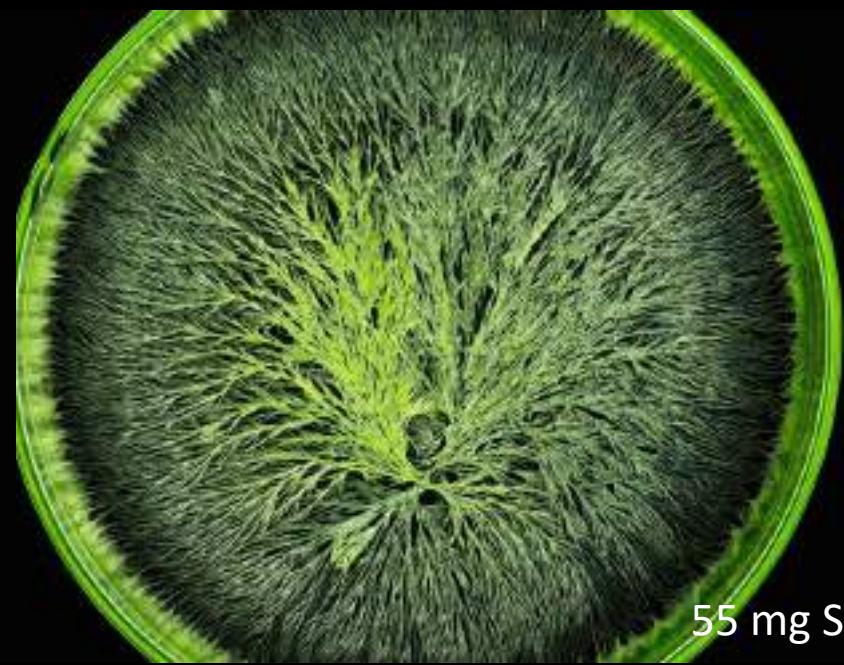
sulphur application wine 2 days bottle opening



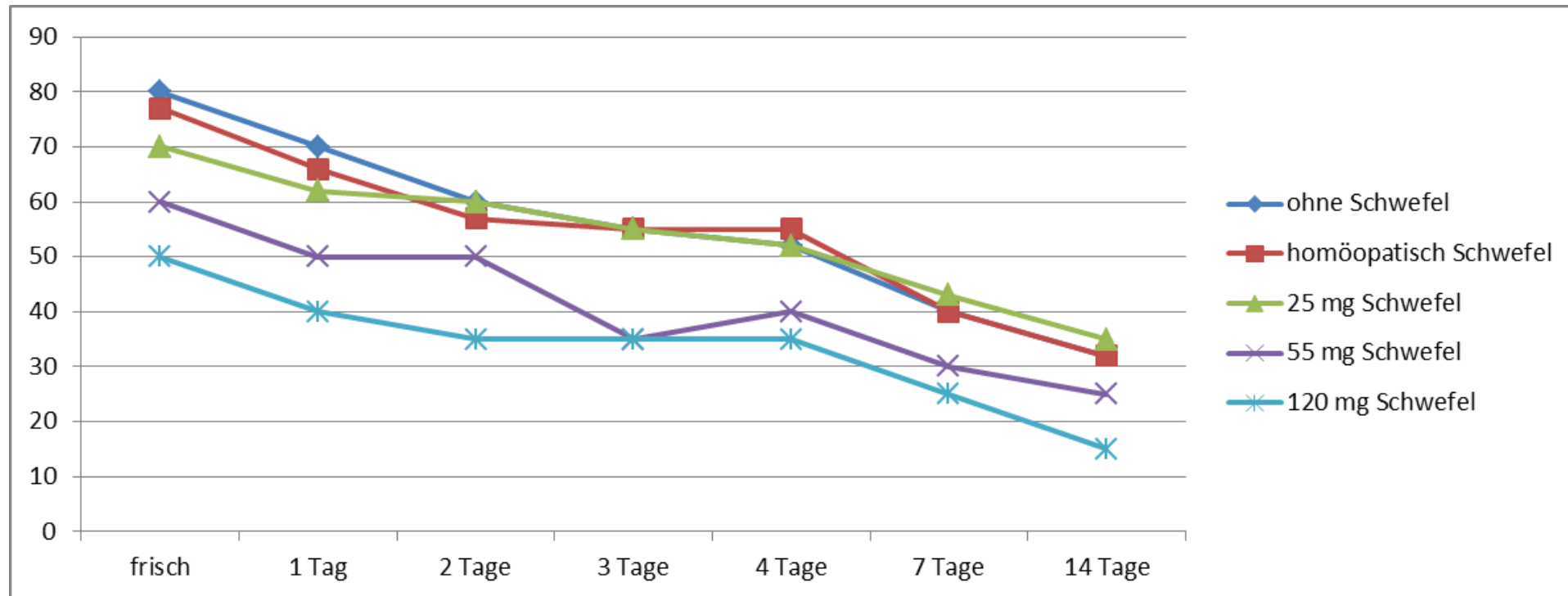
sulphur application wine 7 days bottle opening



sulphur application wine 14 days bottle opening



Quality index of sulfur treatments with image-creating methods



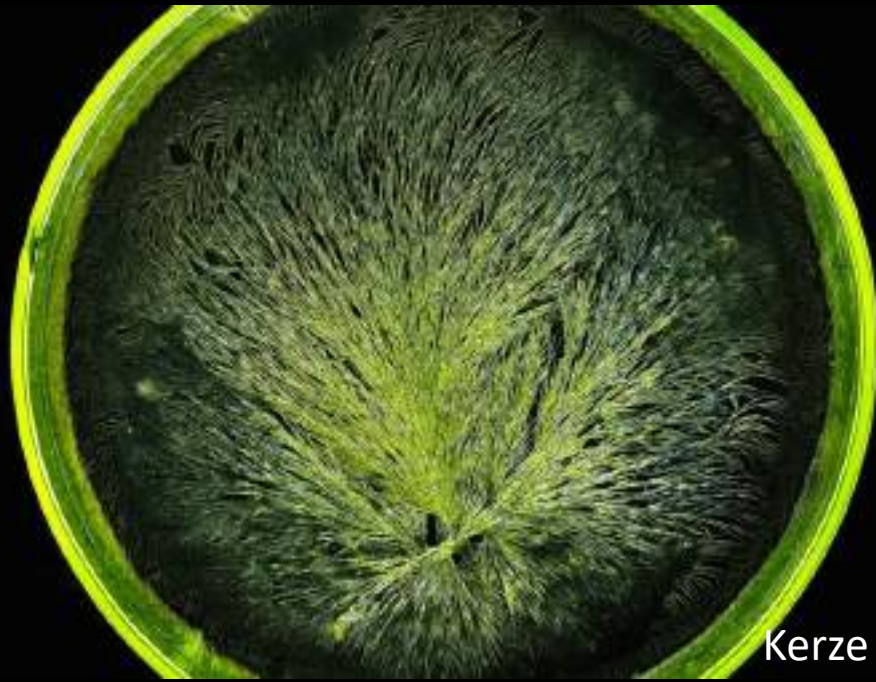
Filter variants wine 0 days bottle open



Filter variants wine 1 days bottle open



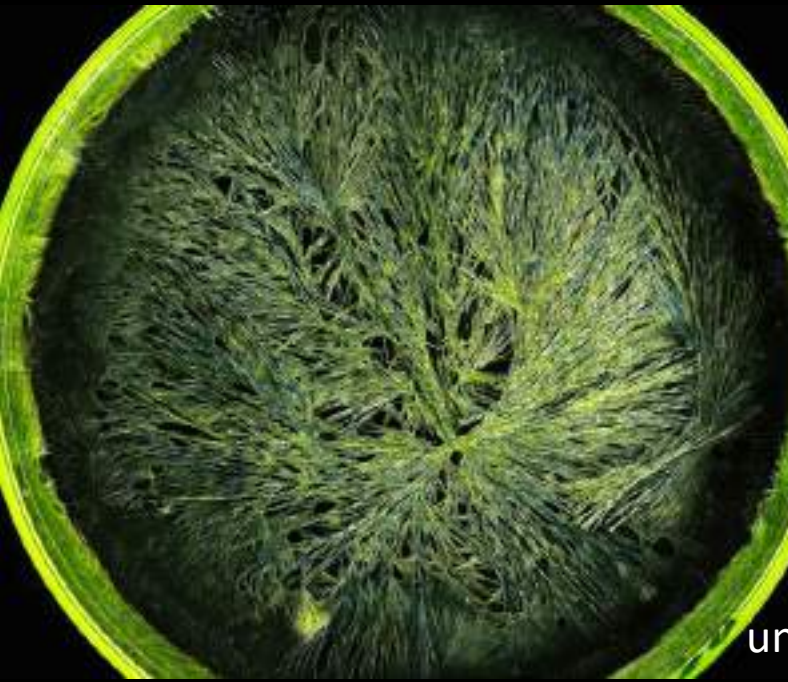
Filter variants wine 2 days bottle open



Kerze 1 μ



Kerze 1 μ (2 bar)



unfiltriert

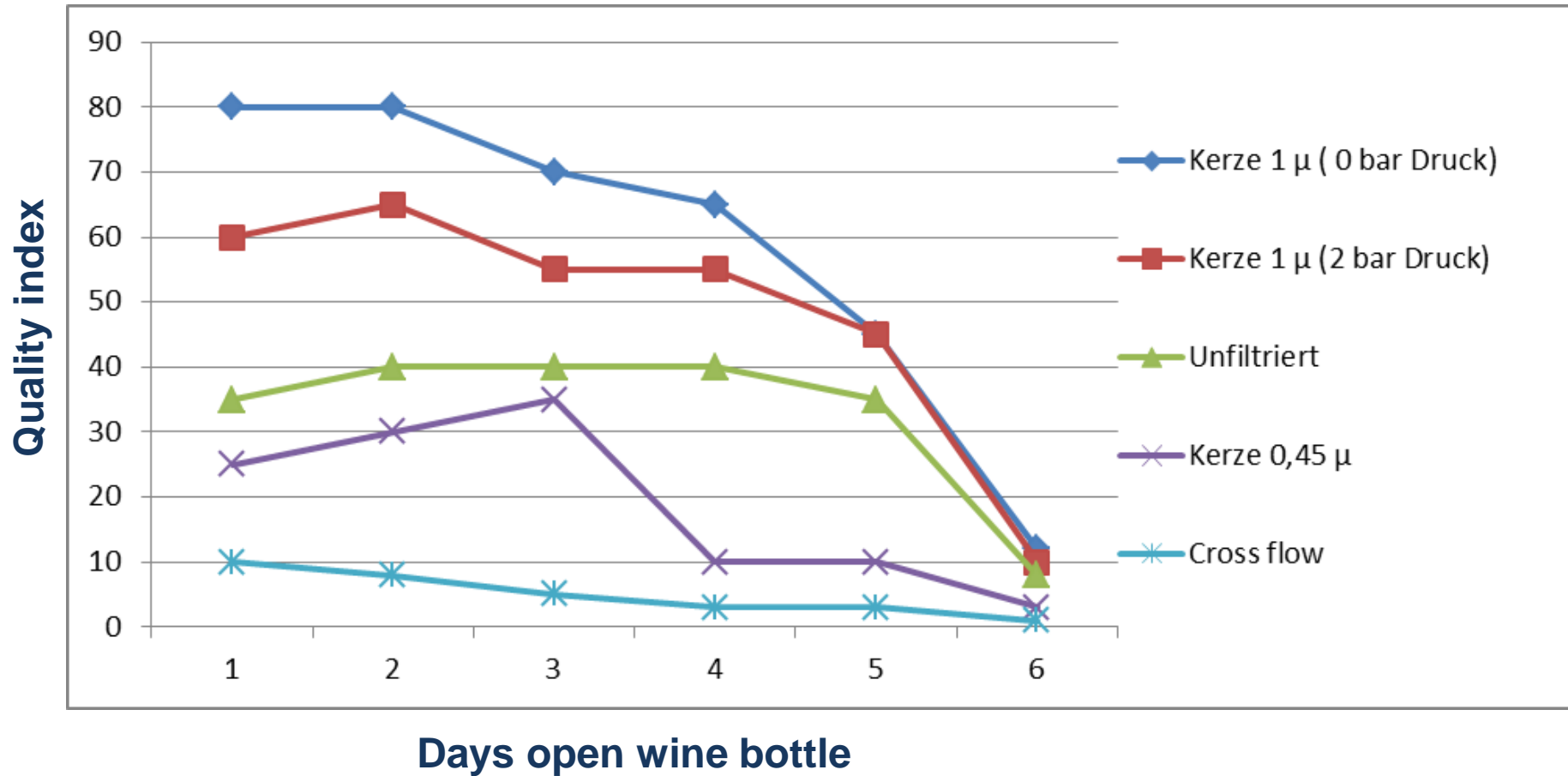


Kerze 0,45 μ



Crossflow 0,45 μ

Quality index of filtration with image-creating methods



Conclusions Application:

→ **Grouping and classification InBioDyn**

- Juice 37 of 39
- Wine 16 of 18

→ **Quality Ranking:**

Dynamic > Organic > Integrated

→ **Sulphur : 0 > D43 > 25 > 55 > 120 mg**

→ **Filters: 1 μ > 1 μ 2b > Unf > 0,45 μ > Cro**