

Drone assisted variety testing

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Sustainability

Value, Cultivation and Use (VCU) VCU

National listing

Performance testing

- Yield
- Resistance
- Agronomic traits
- Quality

TystofteFonden 



Distinctness, Uniformity and Stability

Breeder is granted plant breeder's rights + description of the variety

Distinctness

- Candidate variety differs by morphology from all other known varieties
- Assessments or measurements of morphological characteristics
- Characteristics seldom relevant for VCU-testing
- Variety-to-variety variation

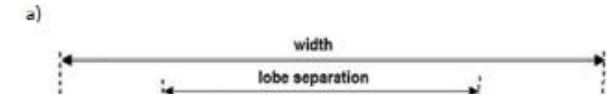
Uniformity

- Plant-to-plant variation

Stability

- Generation-to-generation variation

Characteristics containing the following key in the third column of the Table of Characteristics should be examined as indicated below:

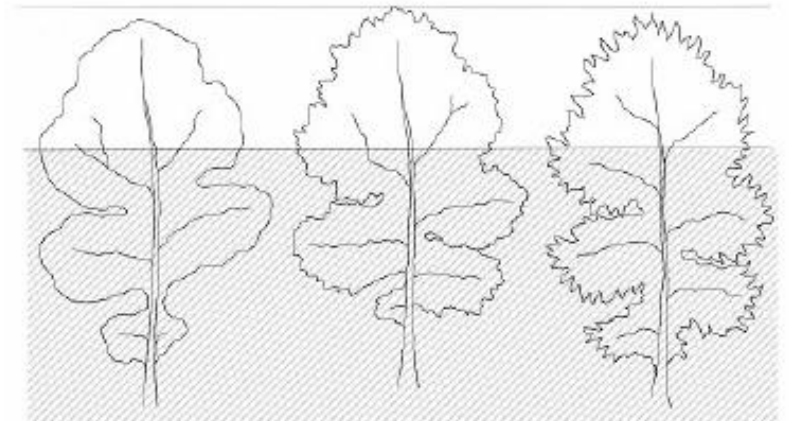


Ad. 9: Leaf: lobes



Ad. 11: Leaf: incisions of margin

Observations should be made on the upper third of the leaf.



1
very weak

5
medium

9
very strong



Ch. 19 – Silique: length
Ch. 20 – Silique: width
Ch. 22 – Silique: length of beak
Ch. 23 – Silique: length of pedicel

Trial design

Plots for distinctness/description

- Small plots (3-6 m² net size)
- Germ% + TGW
- 2 - 3

Ad. 24: Tendency to form inflorescence in alternate season

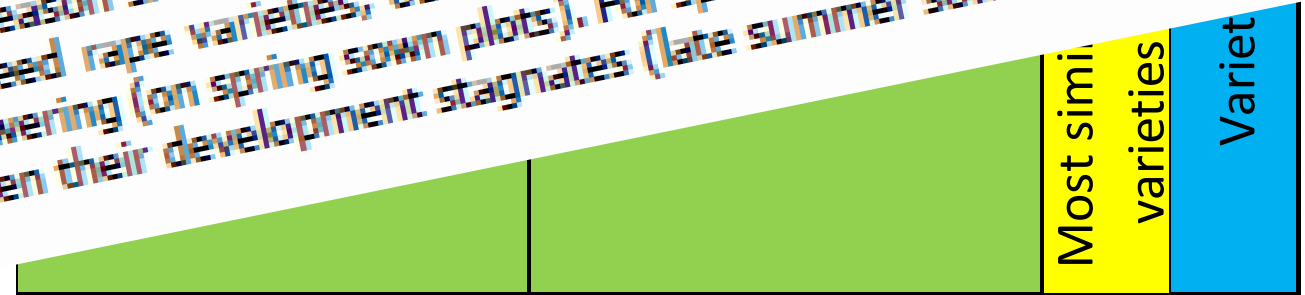
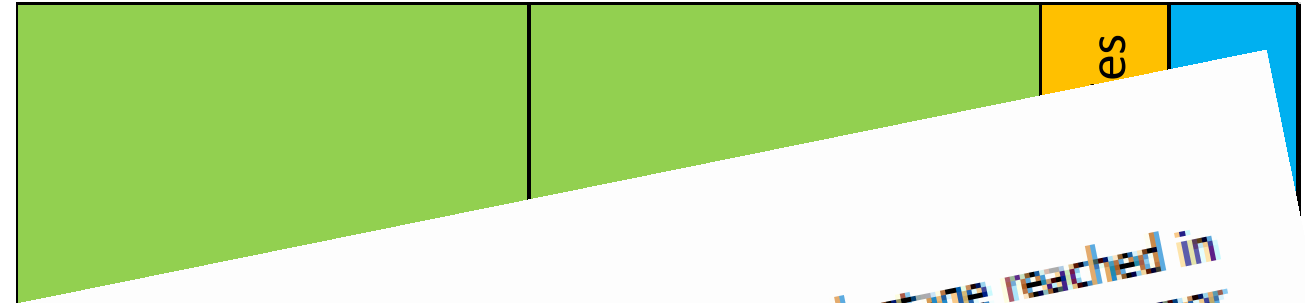
Tendency to form inflorescence in alternate season should be assessed from the growth stage reached in relation to example varieties. For winter oilseed rape varieties, observations should be made in summer when late spring oilseed rape varieties are flowering (on spring sown plots). For spring oilseed rape varieties, observations should be made in autumn, when their development stagnates (late summer sown plots).

Seeded plots

- Large plots (13.5 m²)
- Trial area - fixed crop rotation

Vernalisation

- WOSR + SOSR + winter cereals



		Number of plots																	
		Distincness trial			Extension			Total Dist. trial			Uniformity trial			Vernalisation trial			Total plot number		
Number	Crop	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024
1	Winter wheat	1.720	1.600	1.996	175	156	227	1.895	1.756	2.223	125	141	150	61	138	150	2.081	2.035	2.523
2	Spring wheat	416	420	420	71	98	47	487	518	467	28	28	16	-	-	-	515	546	483
3	Winter rye	1.260	1.218	1.287	152	166	184	1.412	1.384	1.471	106	56	60	111	154	160	1.629	1.594	1.691
4	Winter barley	760	840	820	229	117	170	989	957	990	70	64	84	156	74	82	1.215	1.095	1.156
5	Spring barley	920	960	960	317	371	298	1.237	1.331	1.258	109	94	104	-	-	-	1.346	1.425	1.362
6	Spring oat	336	368	360	125	129	92	461	497	452	22	32	20	-	-	-	483	529	472
11	Field bean	140	144	144	87	108	95	227	252	239	-	-	-	-	-	-	227	252	239
12	Winter oil seed rape	2.100	2.176	2.332	299	225	302	2.399	2.401	2.634	242	213	213	2.130	2.182	2.332	4.771	4.796	5.179
13	Spring oil seed rape	416	416	416	52	52	52	468	468	468	50	72	47	416	416	416	934	956	931
20	Quinoa	-	-	30	20	-	4	20	-	34	-	-	-	-	-	-	20	-	34
68	Festulolium	48	60	56	15	22	14	63	82	70	72	90	84	-	-	-	135	172	154
80	Sugar beet	540	546	546	117	186	220	657	732	766	-	-	-	-	-	-	657	732	766
82	Fodder beet	162	168	150	30	29	48	192	197	198	-	-	-	-	-	-	192	197	198
	Total	8.818	8.916	9.517	1.689	1.659	1.753	10.507	10.575	11.270	824	790	778	2.874	2.964	3.140	14.205	14.329	15.188



DUS Trials 2024



Signaturforklaring

2024

SES2024

- M416-45-2024 SES Vaarhvede
- M419-43-2024 SES Vaarhavre
- M417-38-2024 SES Hestebonne
- M415-54-2024 SES Quinoa
- M415-42-2024 SES Varraps
- M415-41-2024 SES Vaarraps StorPC
- M415-39-2024 SES Sukkerroer
- M415-36-2024 SES NL ID Roer
- M418-43-44-45-2024 SES Vaarsaed StorPC
- M415-36-2024 SES Foderroer
- M411-44-2024 SES Vaarbyg
- M416-39-2024 SES Markaert
- M421-44-2024 SES Vinterhvede
- M418-49-2024 SES Vinterhvede StorPC
- M412-44-2024 SES Vinterrug
- M403-46-2024 SES Vinterbyg
- M418-48-2024 SES Vinterbyg StorPC
- M416-40-2024 SES Vinterraps
- M418-47-2024 SES Vinterraps StorPC
- M418-51-2024 SES Rajsvingel enkeltplanter
- M418-52-2024 SES Rajsvingel raekke

Vejnavne-ortofoto, 1 - 50.000

Nyeste ortofoto, Geodanmark

GPS controlled seeding

Trial design

- Excel, SAS, MiniGIS

GPS

- Trimble RTK - FMX

Plot seeder with plot automatic

- Haldrup SB25 5/11 rows
- Haldrup SP35 6 rows
- HEGE 95 4 rows



Vernalization t

Corporation with local farmer

- Only one assessment
- Avoid volunteer rape seeds at own area
- Adjacent to game cover plantation
- Need for effective design (sowing, plant protection)
- Long and narrow area 96 *24 plots=2304 plots (345*48 m)



Vernalization in winter wheat



Drone and sensor technology



**Micasense RE
dual sensor
10 wavelengths**

**Adjustment for incoming light
and GPS**



DJI Matrice 210 RTK V.2



Materials and methods

- 2 years
- 300 winter wheat genotypes
- 2 replicates
- Plot size brutto 1,5*2m
- Manual plant length measurements
 - 24AUG21 + 28JUL22
 - 5 subsamples / plot
 - Stretched plants
- Drone images
 - 24JUL21 + 26JUL22
 - 2330 subsamples/plot (2,7 cm/pixel)
 - Digital elevation model from Agisoft Metashape v 1.8.1
 - Height above sea level of **Crop surface** = Clip 1*1,7 m (99% fraqtile)
 - Height above sea level of **Soil surface** = Clip 1,6*2,5 m (1% fractile)
 - Canopy height (plant length)= Crop surface – Soil surface



Digital Elevation Model

