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WORKING PAPER ON TEST GUIDELINES FOR WHITE MUSTARD
(*Sinapis alba* L.)

prepared by experts from Germany

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Sinapis alba* L.

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of seed to be supplied by the applicant in one sample should be:

500 g

The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing certified seed in the country in which the application is made. The germination capacity should be as high as possible.

2. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

1. The minimum duration of tests should normally be two similar growing periods.

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The field tests should be carried out under conditions ensuring normal growth. The distance between rows and between plants within the rows should be adjusted to enable observations on individual plants. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include as a minimum 300 plants which should be divided between three or more replicates. In addition each test should include a replicate of minimum 400 plants for the characteristics assessed by observation of a group of plants.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise stated, all observations for assessment of distinctness and stability should be made on 60 plants or parts of plants.

2. For the assessment of uniformity

– unless otherwise stated, all observations determined by measurements should be made on 60 plants or parts of plants (M)

– all single observations of a group of plants or parts of plants should be made on the total plot of minimum 400 plants (VG).

The variability within the variety should not exceed the variability of comparable varieties already known.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.

2. It is recommended that the competent authorities use the following characteristics for grouping varieties:

(a) Seed: erucic acid (characteristic 1)
(b) Ploidy (characteristic 2)
(c) Time of flowering (characteristic 12)

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.

2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of expression for each characteristic.

3. Legend:

(*) Characteristics that should be used on all varieties in every growing period over which examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.

(+) See Explanations on the Table of Characteristics in Chapter VIII.

1) The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column. The stages of development denoted by each number are described at the end of chapter VIII.

M: actual measurement

VG: visual assessment by a single observation of a group of plants or parts of plants

VII. Table of Characteristics

Characteristics			Stage[1)]		Example Varieties	Note
(*)	1. (+)	Seed: erucic acid	00	absent	Rizo	1
				present	Emergo	9
(*)	2. (+)	Ploidy	05	diploid	Emergo	2
				tetraploid	Oscar	4
	3. (+)	Cotyledon: length	11	short to medium	Rizo	4
			M	medium	Emergo	5
				medium to long	Silenda	6
	4. (+)	Cotyledon: width	11	narrow		3
			M	medium	Emergo	5
				broad	Silvester	7
(*)	5.	Leaf: green color	19-39	light		3
			VG	medium	Emergo	5
				dark	Silvester	7
	6. (+)	Leaf: number of lobes (fully developed leaf)	16-39	few	Maxi	3
			M	medium	Emergo	5
				many	Perine	7
	7. (+)	Leaf: dentation of margin	19-39	weak	Emergo	3
			VG	medium	Oscar	5
				strong		7
	8. (+)	Leaf: length (blade and petiole)	19-39	short	Rizo	3
			M	medium	Emergo	5
				long	Sirola	7
	9. (+)	Leaf: width (widest point)	19-39	narrow	Medico	3
			M	medium	Emergo	5
				broad	Oscar	7

Characteristics			Stage[1)]		Example Varieties	Note
	10. (+)	Leaf: length of petiole	19-39	short	Rizo	3
			M	medium	Emergo	5
				long	Sirola	7
	11. (+)	Plant: height at emergence of flower buds	52	low	Silenda	3
			VG	medium	Oscar	5
				tall	Litember	7
(*)	12. (+)	Time of flowering	60	very early	Carla	1
			M	early	Silenda	3
				medium	Litember	5
				late	Sito	7
				very late		9
	13. (+)	Plant: height at flowering	65	low	Serval	3
			VG	medium	Maxi	5
				tall	Litember	7
	14.	Flower: color of petals	65	pale yellow		1
			VG	yellow	Maxi	2
(*)	15.	Plant: total length of stem	89	short	Gisilba	3
			M	medium	Perine	5
				long	Litember	7
(*)	16. (+)	Siliqua: length (between peduncle and beak)	89	short	Emergo	3
			M	medium	Litember	5
				long	Fighter	7
(*)	17. (+)	Siliqua: length of beak	89	short	Carnaval	3
			M	medium	Torpedo	5
				long	Litember	7

Characteristics		Stage[1)]		Example Varieties	Note
18. (+)	Siliqua: width	89	narrow		3
		M	medium	Maxi	5
			broad	Silvester	7
19. (+)	Siliqua: length of peduncle	89	short	Sirola	3
		M	medium	Litember	5
			long	Silvester	7
20.	Siliqua: number of seeds	89	low	Silvester	3
		M	medium	Maxi	5
			high	Litember	7
21.	Seed: Thousand seed weight	89	low	Rizo	3
		M	medium	Silenda	5
			high	Oscar	7
22. (+)	Tendency to form inflorescences in year of sowing for late summer sown trials	VG	absent or very weak		1
			weak	Sina	3
			medium	Silvester	5
			strong	Maxi	7
			very strong	Rizo	9

VIII. Explanations on the Table of Characteristics

Ad. 1: Seed: erucic acid

The erucic acid content should be observed on seed sent in by the applicant. It should be expressed as a percentage by mass of methyl esters in accordance with the ISO standard in document 5508, paragraph 6.2.2.1. Seed containing 2 % or less of erucic acid will be classified as “absent.”

Ad. 2: Ploidy

Ploidy should be assessed on at least 100 seedlings.

Ad. 3 + 4: Cotyledon: length (3) and width (4)

The measurement should be taken in the glasshouse. If the two cotyledons differ in size, the bigger one should be measured. The length is defined as distance between the inclination at top of the cotyledon and the point where the width of the petiole is about 4 mm. The width of the cotyledon should be measured at the widest point of the cotyledons.

Ad. 6: Leaf: number of lobes

Parts of the leaf blade are considered as lobes if their length is at least equivalent to the width of the leaf petiole at their point of attachment and if the upper notch of the blade has at least half the length of the lobe itself.

Ad. 7-10: Leaf: dentation (7), length (8), width (9), length of petiole (10)

7 = part on which the dentation should be recorded (characteristic 7)

Ad. 11: Plant: height at emergence of flower buds

The height of the plants should be assessed when 50 % of the plants have reached stage 52. The mean height of plants at stage 52 should be measured.

Ad. 12: Time of flowering

The observation should be done at least three times per week and more frequently if there is any need to do so. The date should be calculated - if necessary by interpolation - at which 50 % of plants show at least one open flower.

Ad. 13: Plant: height at flowering

The height of the plants should be assessed when all normally developed plants have opened at least one flower.

Ad. 16-20: Siliqua

All observations on the siliqua should be recorded in the midpart of the inflorescence of the main stem.

Ad. 22: Tendency to form inflorescences in year of sowing for late summer sown trials

The observation of the growth stage reached should be made in autumn, when the development stagnates.

KEY FOR THE GROWTH STAGES

Code	Description
Principal growth stage 0: Germination	
00	Dry seed
01	Beginning of seed imbibition
03	Seed imbibition complete
05	Radicle emerged from seed
07	Hypocotyl with cotyledons emerged from seed
08	Hypocotyl with cotyledons growing towards soil surface
09	Emergence: cotyledons emergence through
Principal growth stage 1: Leaf development	
10	Cotyledons completely unfolded
11	First leaf unfolded
12	2 leaves unfolded
13	3 leaves unfolded
1.	Stages continuous till...
19	9 or more leaves unfolded
Principal growth stage 2: Formation of side shoots	
20	No side shoots
21	Beginning of side shoot de development: first side shoot detectable
22	2 side shoots detectable
23	3 side shoots detectable
2.	Stages continuous till...
29	End of side shoot development: 9 or more side shoots detectable
Principal growth stage 3: Stem elongation	
30	Beginning of stem elongation: no internodes (“rosette”)
31	1 visibly extended internodes
32	2 visibly extended internodes
33	3 visibly extended internodes
3.	Stages continuous till...
39	9 or more visibly extended internodes
Principal growth stage 4: --	
Principal growth stage 5: Inflorescence emergence	
50	Flower buds present, still enclosed by leaves
51	Flower buds visible from above (“green bud”)
52	Flower buds free, level with the youngest leaves
53	Flower buds raised above the youngest leaves
55	Individual flower buds (main inflorescence) visible but still closed
57	Individual flower buds (secondary inflorescences) visible but still closed
59	First petals visible, flower buds still closed (“yellow bud”)

Code	Description
Principal growth stage 6: Flowering	
60	First flowers open
61	10 % of flowers on main raceme open, main raceme elongating
62	20 % of flowers on main raceme open
63	30 % of flowers on main raceme open
64	40 % of flowers on main raceme open
65	Full flowering 50 % flowers on main raceme open, older petals falling
67	Flowering declining: majority of petals fallen
69	End of flowering
Principal growth stage 7: Development of fruit	
71	10 % of pods have reached final size
72	20 % of pods have reached final size
73	30 % of pods have reached final size
7.	Stages continuous till...
78	80 % of pods have reached final size
79	Nearly all pods have reached final size
Principal growth stage 8: Ripening	
80	Beginning of ripening: seed green, filling pod cavity
81	10 % of pods ripe, seeds dark and hard
82	20 % of pods ripe, seeds dark and hard
83	30 % of pods ripe, seeds dark and hard
8.	Stages continuous till...
88	80 % of pods ripe, seeds dark and hard
89	Fully ripe: nearly all pods ripe, seeds dark and hard

IX. Literature

Growth stages of mono- and dicotyledonous plants: BBCH-Monograph. Federal Biological Research Centre of Agriculture and Forestry (ed.) Ed. by Uwe Meier.-Berlin; Wien [u.a.]: Blackwell Wiss.-Verl., 1997, pp. 26-30.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Species	*Sinapis alba L.* White Mustard
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Genetic origin and breeding method

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to that question is yes, please attach a copy of such an authorization.

4.2 Other information

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the state of expression which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Seed: erucic acid**		
	absent	Rizo	1[ ]
	present	Emergo	9[ ]
5.2 (2)	**Ploidy**		
	diploid	Emergo	2[ ]
	tetraploid	Oscar	4[ ]
5.3 (12)	**Time of flowering**		
	very early	Carla	1[ ]
	early	Silenda	3[ ]
	medium	Litember	5[ ]
	late	Sito	7[ ]
	very late		9[ ]
5.4 (15)	**Plant: total length of stem**		
	short	Gisilba	3[ ]
	medium	Perine	5[ ]
	long	Litember	7[ ]

6. Similar varieties and differences from these varieties

Denomination of similar variety	Characteristic in which the similar variety is different [o)]	State of expression of similar variety	State of expression of candidate variety

o) In the case of identical states of expressions of both varieties, please indicate the size of the difference.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

7.2 Special conditions for the examination of the variety

7.3 Other information

[End of document]