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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

WATERCRESS

UPOV Code(s): NASTU_MIC; NASTU_OFF; NASTU_STE

Nasturium microphyllum Boenn. ex Rchb.;
Nasturium officinale R. Br.;
Nasturium xsterile (Airy Shaw) Oefelein

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from United Kingdom
to be considered by the
Enlarged Editorial Committee
at its meeting, to be held in Geneva
from 2019-03-26 to 2019-03-27

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Nasturtium microphyllum Boenn. ex Rchb.	One-row watercress			
Nasturtium officinale R. Br., *Rorippa nasturtium-aquaticum* (L.) Hayek	Watercress	Cresson de fontaine, Cresson d'eau	Brunnenkresse	Berro
Nasturtium xsterile (Airy Shaw) Oefelein, *Nasturtium microphyllum* x *Nasturtium officinale*, *Rorippa microphylla* x *Rorippa nasturtium-aquaticum*				

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Nasturtium microphyllum* Boenn. ex Rchb., *Nasturtium officinale* R. Br and *Nasturtium xsterile* (Airy Shaw) Oefelein.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seed or plants.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

10 g for seed-propagated varieties
40 plants for vegetatively propagated varieties

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

3.1.1 The minimum duration of tests should normally be two independent growing cycles.

3.1.2 The two independent growing cycles should be in the form of two separate plantings.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.4 Test Design

3.4.1 In the case of seed-propagated varieties, each test should be designed to result in a total of at least 60 plants which should be divided between at least 2 replicates.

3.4.2 In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 30 plants which should be divided between at least 2 replicates.

3.4.3 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or Parts of Plants to be Examined

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 40 plants or parts taken from each of 40 plants and any other observation made on all plants in the test, disregarding any off-type plants.

In the case of , unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observation made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 These Test Guidelines have been developed for the examination of seed and vegetatively propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.4 For the assessment of uniformity of seed-propagated varieties, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 2 off-types are allowed.

4.2.5 For the assessment of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95 % will be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: growth habit (characteristic 2)
(b) Time of beginning of flowering (characteristic 22)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

Nasturtium microphyllum Boenn. ex Rchb. differs from *Nasturtium officinale* R. Br. in having a uniseriate arrangement of seeds compared to a biseriate arrangement for *N. officinale*.

The different species are indicated in the table of characteristics.

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(f) See Explanations on the Table of Characteristics in Chapter 8.1

7 Not applicable

(m) *Nasturtium microphyllum*
(o) *Nasturtium officinale*

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.		**QN MG/VG**	**(a)**				
		Plant: height	**Plante : hauteur**	**Pflanze: Höhe**	**Planta: altura**		
		short	basse	niedrig	baja		1
		medium	moyenne	mittel	media	John Hurd's 98 Special (o)	2
		tall	haute	hoch	alta		3
2.	**(*)**	**QN VG**	**(a)**				
		Plant: growth habit	**Plante : port**	**Pflanze: Wuchsform**	**Planta: hábito de crecimiento**		
		erect	dressé	aufgerichtet	erecta		1
		semi erect	demi-dressé	halbaufgerichtet	semierecta	John Hurd's 98 Special (o)	2
		prostrate	étalé	liegend	postrada		3
3.	**(*)**	**QN MS/VG**	**(+)** **(a)**				
		Plant: number of axillary branches	**Plante : nombre de ramifications axillaires**	**Pflanze: Anzahl axillarer Zweige**	**Planta: número de ramas axilares**		
		few	petit	wenige	bajo		1
		medium	moyen	mittel	medio	Emerald (o)	2
		many	grand	viele	alto	Boldrewood (o)	3
4.		**QN MS/VG**	**(+)** **(a)**				
		Stem: internode length	**Tige : longueur de l'entrenœud**	**Stengel: Internodienlänge**	**Tallo: longitud del entrenudo**		
		short	court	kurz	corto	Boldrewood (o)	1
		medium	moyen	mittel	medio	John Hurd's 98 Special (o)	3
		long	long	lang	largo		5
5.		**QN MS/VG**	**(a)**				
		Stem: thickness	**Tige : épaisseur**	**Stengel: Dicke**	**Tallo: grosor**		
		thin	mince	dünn	delgado		1
		medium	moyenne	mittel	medio		2
		thick	épaisse	dick	grueso		3
6.		**QN VG**	**(a)**				
		Stem: intensity of green color	**Tige : intensité de la couleur verte**	**Stengel: Intensität der Grünfärbung**	**Tallo: intensidad del color verde**		
		light	claire	hell	claro		1
		medium	moyenne	mittel	medio		2
		dark	foncée	dunkel	oscuro		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.		**QN VG**	**(a)**				
		Stem: intensity of anthocyanin coloration	**Tige : intensité de la pigmentation anthocyanique**	**Stengel: Intensität der Anthocyanfärbung**	**Tallo: intensidad de la pigmentación antociánica**		
		light	claire	hell	clara		1
		medium	moyenne	mittel	media	John Hurd's 98 Special (o)	3
		dark	foncée	dunkel	oscura	Sophie (m)	5
8.		**QN VG**	**(+) (a)**				
		Stem: number of aerial roots	**Tige : nombre de racines aériennes**	**Stengel: Anzahl Luftwurzeln**	**Tallo: número de raíces aéreas**		
		few	petit	wenige	bajo		1
		medium	moyen	mittel	medio	Emerald (o)	2
		many	grand	viele	alto		3
9.		**QN VG**	**(a)**				
		Stem: hairiness	**Tige : pilosité**	**Stengel: Behaarung**	**Tallo: vellosidad**		
		absent or very weak	nulle ou très faible	fehlend oder gering	ausente o muy escasa	John Hurd's 98 Special (o), Sophie (m)	1
		medium	moyenne	mittel	media		2
		strong	forte	stark	abundante		3
10.		**QN VG**	**(a)**				
		Foliage: glossiness	**Feuillage : brillance**	**Laub: Glanz**	**Follaje: brillo**		
		weak	faible	gering	leve	Boldrewood (o)	1
		medium	moyenne	mittel	medio		2
		strong	forte	stark	intenso		3
11.		**QN VG**	**(+) (a)**				
		Leaf: profile of terminal leaflet in cross-section	**Feuille : profil de la foliole terminale en section transversale**	**Blatt: Profil der Endfieder im Querschnitt**	**Hoja: perfil del folíolo terminal en sección transversal**		
		concave	concave	konkav	cóncavo		1
		flat	plat	flach	plano	Emerald (o)	2
		convex	convexe	konvex	convexo		3
12.	**(*)**	**QN MS/VG**	**(d), (e)**				
		Leaf: length	**Feuille : longueur**	**Blatt: Länge**	**Hoja: longitud**		
		short	courte	kurz	corta		1
		medium	moyenne	mittel	media	Boldrewood (o)	2
		long	longue	lang	larga		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**(*)**	**QN MS/VG**	**(d), (e)**				
		Leaf: width	**Feuille : largeur**	**Blatt: Breite**	**Hoja: anchura**		
		narrow	étroite	schmal	estrecha		1
		medium	moyenne	mittel	media	Boldrewood (o)	2
		broad	large	breit	ancha		3
14.		**QN VG**	**(a)**				
		Leaf: intensity of green color	**Feuille : intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
		light	claire	hell	claro		1
		medium	moyenne	mittel	medio		2
		dark	foncée	dunkel	oscuro		3
15.		**QN VG**	**(a)**				
		Leaf: intensity of anthocyanin coloration	**Feuille : intensité de la pigmentation anthocyanique**	**Blatt: Intensität der Anthocyanfärbung**	**Hoja: intensidad de la pigmentación antociánica**		
		absent or weak	absente ou faible	fehlend oder gering	ausente o leve	Emerald (o)	1
		medium	moyenne	mittel	media		2
		strong	forte	stark	intensa		3
16.	**(*)**	**QN MS/VG**	**(d), (e)**				
		Leaf: length of terminal leaflet	**Feuille : longueur de la foliole terminale**	**Blatt: Länge der Endfieder**	**Hoja: longitud del folíolo terminal**		
		short	courte	kurz	corto	Boldrewood (o)	1
		medium	moyenne	mittel	medio	Emerald (o)	3
		long	longue	lang	largo	John Hurd's 98 Special (o)	5
17.	**(*)**	**QN MS/VG**	**(d), (e)**				
		Leaf: width of terminal leaflet	**Feuille : largeur de la foliole terminale**	**Blatt: Breite der Endfieder**	**Hoja: anchura del folíolo terminal**		
		narrow	étroite	schmal	estrecho		1
		medium	moyenne	mittel	medio	Emerald (o)	2
		broad	large	breit	ancho	John Hurd's 98 Special (o)	3
18.	**(*)**	**PQ VG**	**(+) (d)**				
		Leaf: shape of terminal leaflet	**Feuille : forme de la foliole terminale**	**Blatt: Form der Endfieder**	**Hoja: forma del folíolo terminal**		
		ovate	ovale	eiförmig	oval	Sophie (m)	1
		lanceolate	lancéolée	lanzettlich	lanceolado		2
		narrow elliptic	elliptique étroite	schmal elliptisch	elíptico estrecho		3
		medium elliptic	elliptique moyenne	mittel elliptisch	elíptico medio		4
		circular	circulaire	kreisförmig	circular	John Hurd's 98 Special (o)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	**(*)**	**PQ VG**	**(+) (d)**				
		Leaf: shape of apex of terminal leaflet	**Feuille : forme de l'apex de la foliole terminale**	**Blatt: Form der Spitze der Endfieder**	**Hoja: forma del ápice del folíolo terminal**		
		acute	pointu	spitz	agudo		1
		obtuse	obtus	stumpf	obtuso		2
		rounded	arrondi	abgerundet	redondeado		3
20.	**(*)**	**PQ VG**	**(+) (d)**				
		Leaf: shape of base of terminal leaflet	**Feuille : forme de la base de la foliole terminale**	**Blatt: Form der Basis der Endfieder**	**Hoja: forma de la base del folíolo terminal**		
		obtuse	obtuse	stumpf	obtusa		1
		truncate	tronquée	gerade	truncada		2
		cordate	cordée	herzförmig	cordada		3
21.		**QN MS/VG**	**(d), (e)**				
		Petiole: length from axil to first leaflet	**Pétiole : longueur de l'aisselle à la première foliole**	**Blattstiel: Länge von der Achsel zur ersten Blattfieder**	**Pecíolo: longitud desde la axila hasta el primer folíolo**		
		short	court	kurz	corto		1
		medium	moyen	mittel	medio	Emerald (o)	2
		long	long	lang	largo		3
22.	**(*)**	**QN MS/VG**	**(+) (b)**				
		Time of beginning of flowering	**Époque de début de floraison**	**Zeitpunkt des Blühbeginns**	**Época de inicio de la floración**		
		early	précoce	früh	temprana	Aqua (o)	1
		medium	moyenne	mittel	media	Emerald (o)	3
		late	tardive	spät	tardía		5
23.	**(*)**	**QN MS/VG**	**(b)**				
		Number of plants with flowers	**Nombre de plantes avec des fleurs**	**Anzahl Pflanzen mit Blüten**	**Número de plantas con flores**		
		low	petit	gering	bajo	John Hurd's 98 Special (o)	1
		medium	moyen	mittel	medio	Emerald (o)	3
		high	grand	hoch	alto	Aqua (o)	5
24.	**(*)**	**QN MS/VG**	**(b)**				
		Flower: diameter	**Fleur : diamètre**	**Blüte: Durchmesser**	**Flor: diámetro**		
		small	petit	klein	pequeño		1
		medium	moyen	mittel	medio	John Hurd's 98 Special (o)	2
		large	grand	groß	grande		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.		**QN MS/VG**	**(c), (f)**				
		Pedicel: length	**Pédicelle : longueur**	**Blütenstiel: Länge**	**Pedicelo: longitud**		
		short	court	kurz	corto	John Hurd's 98 Special (o)	1
		medium	moyen	mittel	medio		2
		long	long	lang	largo		3
26.	**(*)**	**QN MS/VG**	**(c), (f)**				
		Siliqua: length	**Silique : longueur**	**Schote: Länge**	**Silicua: longitud**		
		short	courte	kurz	corta		1
		medium	moyenne	mittel	media	Sophie (m)	3
		long	longue	lang	larga	Emerald (o)	5
27.	**(*)**	**QN MS/VG**	**(c), (f)**				
		Siliqua: width	**Silique : largeur**	**Schote: Breite**	**Silicua: anchura**		
		narrow	étroite	schmal	estrecha		1
		medium	moyenne	mittel	media	Sophie (m)	3
		broad	large	breit	ancha	Emerald (o)	5

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

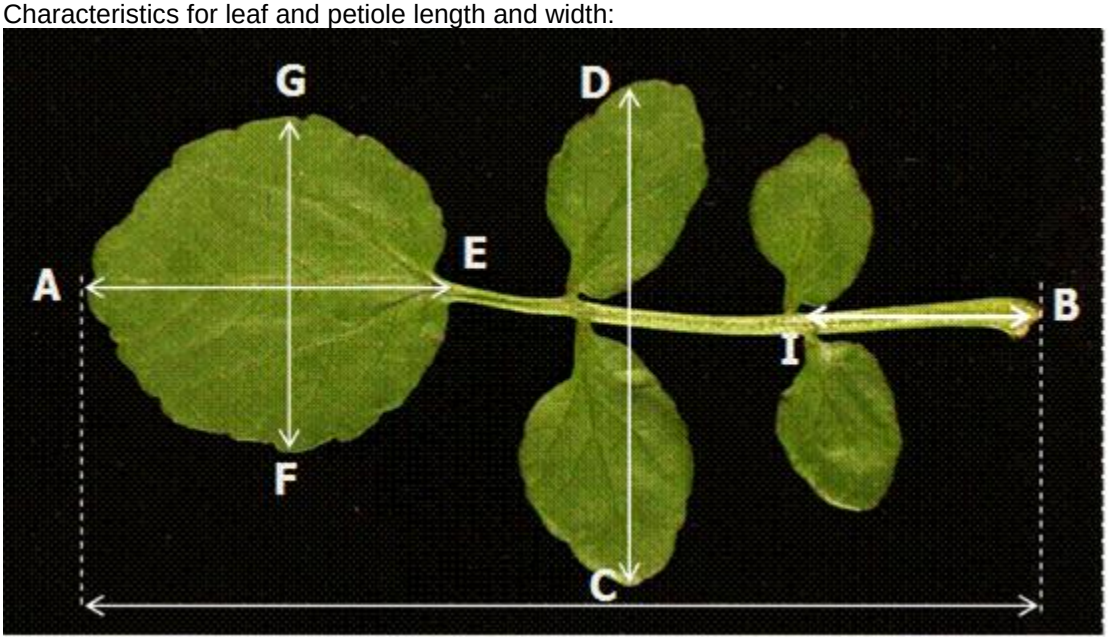
(a) Observations should be made before flowering when leaves are fully developed.

(b) Observations should be made on fully developed, fresh flowers.

(c) Observations should be made on fully developed siliquas at early stages of senescence.

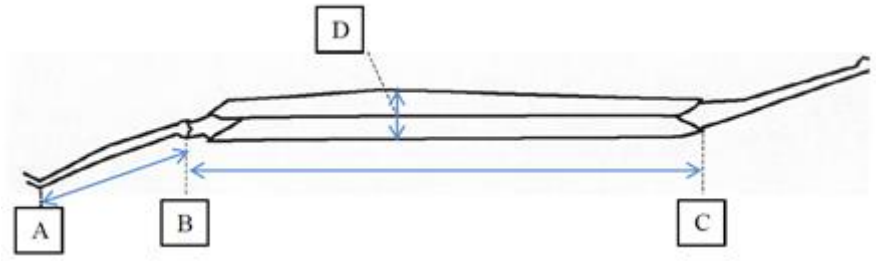
(d) Observations should be made before flowering when leaves are fully developed, on plants with excised axillary branches.

(e) Characteristics for leaf and petiole length and width:



Ad. 12: Leaf: length (A – B)
Ad. 13: Leaf: width (C – D)
Ad. 16: Leaf: length of terminal leaflet (A – E)
Ad. 17: Leaf: width of terminal leaflet (F – G)
Ad. 21: Petiole: length from axil to first leaflet (B – I)

(f) Characteristics for pedicel and siliqua lengths and widths:



Ad. 25: Pedicel: length (A – B)
Ad. 26: Siliqua: length (B – C)
Ad. 27: Siliqua: width (D)

8.2 Explanations for individual characteristics

Ad. 3: Plant: number of axillary branches

1
few

2
medium

3
many

Ad. 4: Stem: internode length

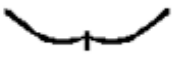
Observations should be made in the middle third of the stem.

Ad. 8: Stem: number of aerial roots

3
few

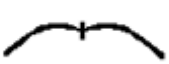
7
many

Ad. 11: Leaf: profile of terminal leaflet in cross-section



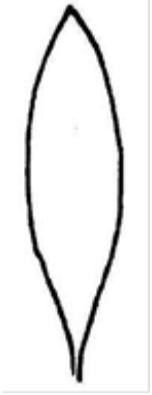
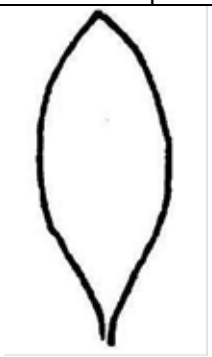
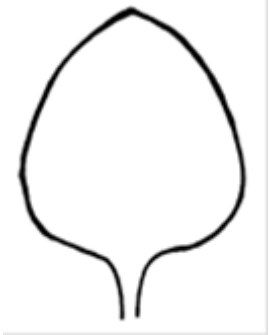
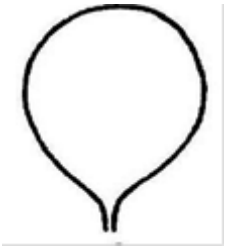
1
concave

2
flat



3
convex

Ad. 18: Leaf: shape of terminal leaflet

width (ratio length/width)	← broadest part →	
	below middle	at middle
narrow (high)	 1 lanceolate	 5 narrow elliptic
medium (medium)		 4 medium elliptic
broad (low)	 2 ovate	 3 circular

Ad. 19: Leaf: shape of apex of terminal leaflet

1
acute

2
obtuse

3
rounded

Ad. 20: Leaf: shape of base of terminal leaflet

1
obtuse

2
truncate

3
cordate

Ad. 22: Time of beginning of flowering

The time of beginning of flowering is when 10% of the plants in a plot have at least one fully open flower.

9. Literature

Bleasdale J.K.A., 1964: The flowering and growth of watercress (*Nasturtium officinale* R. Br.). J. Hort Sci. 39, pp. 277 to 83.

Bleeker, W., Huthmann., M. and Hurka, H., 1999: Evolution of hybrid tax in *Nasturtium* R. Br. (*Brassicaceae*). Folia Geobotanica. 34. pp. 421 to 433.

Clapham, A.R., Tutin, T.G. and Warburg, E.F., 1981: Flora of the British Isles. Cambridge University Press. 3rd Edition pp. 60 to 64.

Howard, H.W. and Manton, I., 1946: Autopolyploid and Allopolyploid Watercress with the description of a new species. Annals of Botany N.S. Vol. 10 No. 37 pp. 1 to 16

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Sheridan, G.E.C., 1996: Molecular studies of Watercress Phylogeny and the Crook-Root Pathogen. PhD thesis University of Bath (British Library Ref DX 205310).

Sheridan G.E.C., Claxton J.R., Clarkson J.M. and Blakesley D., 2001: Genetic diversity within commercial populations of watercress (*Rorippa nasturtium-aquaticum*), and between allied *Brassicaceae* inferred from RAPD-PCR. Euphytica 122 (2), pp. 319 to 325.

Stevens, C.P., 1983: Watercress: production of the cultivated crop. ADAS/MAFF Reference Book 136. Grower Books. London, GB

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

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

1. Subject of the Technical Questionnaire

1.1.1	Botanical name	*Nasturtium microphyllum* Boenn. ex Rchb.	[ ]
1.1.2	Common name	One-row watercress	
1.2.1	Botanical name	*Nasturtium officinale* R. Br.	[ ]
1.2.2	Common name	Watercress	
1.3.1	Botanical name	*Nasturtium xsterile* (Airy Shaw) Oefelein	[ ]
1.3.2	Common name		

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]

(please state parent varieties)
(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(please state known parent varieties)
(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(Please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Cross-pollination [ ]
(c) Other (please provide details) [ ]

4.2.2 Vegetative propagation

(a) Cuttings [ ]
(b) *In vitro* propagation [ ]
(c) Other (state method) [ ]

4.2.3 Other [ ]
(Please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

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

	Characteristics	Example Varieties	Note
5.1 (2)	**Plant: growth habit**		
	erect		1 [ ]
	semi erect	John Hurd's 98 Special (o)	2 [ ]
	prostrate		3 [ ]
5.2 (12)	**Leaf: length**		
	short		1 [ ]
	medium	Boldrewood (o)	2 [ ]
	long		3 [ ]
5.3 (16)	**Leaf: length of terminal leaflet**		
	short	Boldrewood (o)	1 [ ]
	short to medium		2 [ ]
	medium	Emerald (o)	3 [ ]
	medium to long		4 [ ]
	long	John Hurd's 98 Special (o)	5 [ ]
5.4 (18)	**Leaf: shape of terminal leaflet**		
	ovate	Sophie (m)	1 [ ]
	lanceolate		2 [ ]
	narrow elliptic		3 [ ]
	medium elliptic		4 [ ]
	circular	John Hurd's 98 Special (o)	5 [ ]
5.5 (22)	**Time of beginning of flowering**		
	early	Aqua (o)	1 [ ]
	early to medium		2 [ ]
	medium	Emerald (o)	3 [ ]
	medium to late		4 [ ]
	late		5 [ ]
5.6 (23)	**Number of plants with flowers**		
	low	John Hurd's 98 Special (o)	1 [ ]
	low to medium		2 [ ]
	medium	Emerald (o)	3 [ ]
	medium to high		4 [ ]
	high	Aqua (o)	5 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Plant: growth habit*	*erect*	*prostrate*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

8. Authorization for release

(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 (b) is yes, please attach a copy of the authorization.

9. Information on plant material to be examined or submitted for examination

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

.....

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ]

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]