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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

PEA
UPOV Code: PISUM_SAT
Pisum sativum L.

GUIDELINES
FOR THE CONDUCT OF TESTS
FOR DISTINCTNESS, UNIFORMITY AND STABILITY

* 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.]

1. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

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

- (a) Leaflet: Unless otherwise indicated, all observations should be made on the first leaflet at the second flowering node.
- (b) Stipule, flower and peduncle: Unless otherwise indicated, all observations should be made at the second flowering node
- (c) Pod: Unless otherwise indicated, all observations should be made at the second fertile node
- (d) Seed of varieties with plant anthocyanin coloration present contain tannins in the testa, which may darken with age, obscuring the expression of other seed characteristics. Recording of these seed characteristics should be carried out within nine months of harvest; assessment is easiest under conditions of bright natural daylight.

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: anthocyanin coloration

The anthocyanin coloration should be recorded as present if anthocyanin occurs in one or more of the following: seed, foliage, stem, axil, flower or pod.

Ad. 3: Stem: fasciation

Fasciated stems may be ribbed and flattened up to a width of 3 cm; several apical growing points often result in multiple flowers or pods at the top of the plant.



multiple flowers



ribbed stems

Ad. 4: Stem: length

Only the main stem should be recorded. The observations should be made on harvested plants when seed is green and fully developed. The measurement should include the first two nodes with 'scale' leaves.

Ad. 5: Stem: number of nodes up to and including first fertile node

Only the main stem should be recorded. The first two nodes, which have 'scale' leaves, should be included in all node counts.

A

Ad. 23: Time of flowering

The time of flowering is when 30% of plants have at least one flower open.

Ad. 24: Only varieties with stem fasciation absent: Plant: maximum number of flowers per node

Assessment should be made over all flowering nodes on the main stem of the plant. A count is made of the maximum number of flowers at any node on each plant examined. An average is then calculated for the total number of plants examined per plot.

As flower set is dependent on temperature and available soil moisture, it is not unusual to record mean flower numbers between 1, 2 and 3 flowers. Mean values within 0.2 of a whole number should be rounded to that number for descriptive purposes e.g. mean 1.2 will be one flowered (note 1) and 1.8 will be two flowered (note 3). All other mean values will fall into the intermediate states e.g. 1.3 or 1.7 will be one to two flowered (note 2).

Ad. 28: Flower: shape of base of standard

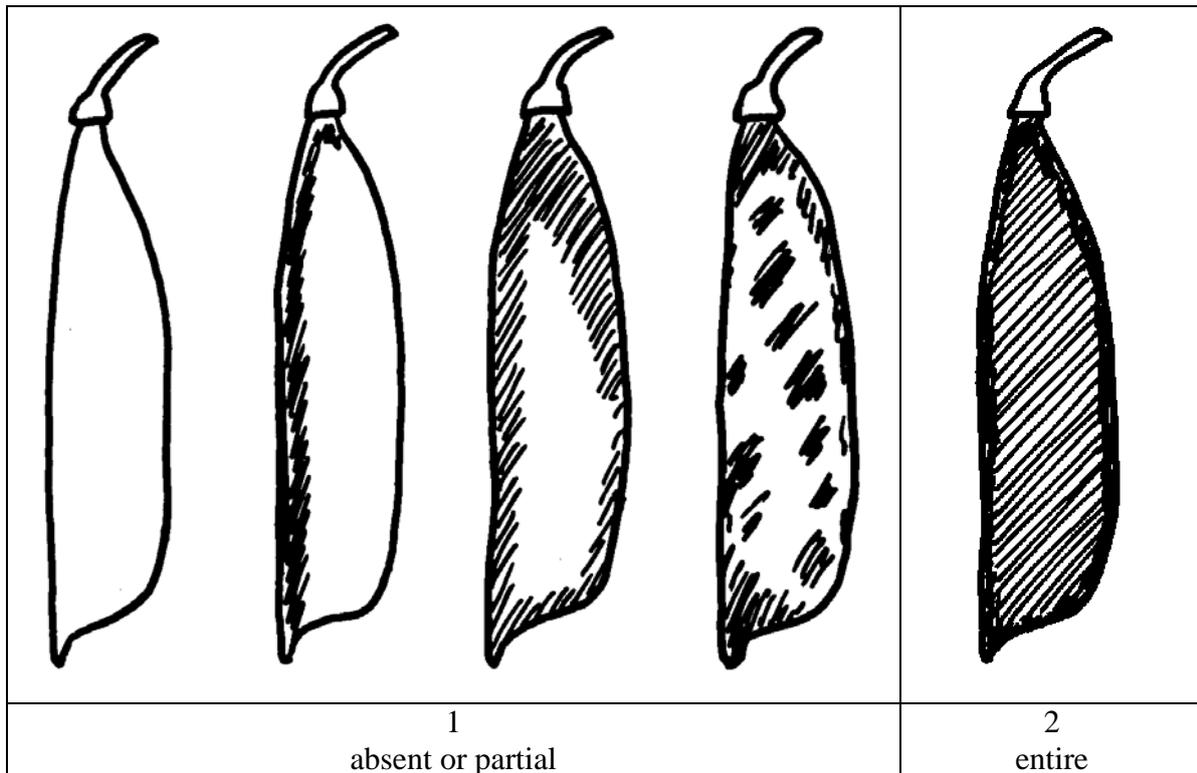
The standard should be detached and flattened on a hard, flat surface.



Ad. 36: Pod: width

The observations should be made on well developed green pods; the width is assessed from suture to suture on unopened pods.

Ad. 37: Pod: parchment
(viewed on the inside of the pod wall)



(1) The observations should be made on dry pods with the exception of ‘Snap Peas’. Snap Peas (Sugar Peas with thickened pod walls) are best recorded when green, in order to minimize fungal infection which can prevent observation of the parchment.

(2) The pod should be opened along the suture without damaging the edges of the two sides of the pod. The distribution of sclerenchyma, which makes up the parchment, may either be observed by staining (a drop of Phloroglucinol dissolved in Ethanol followed by a drop of concentrated (37%) Hydrochloric Acid), or by reflecting light (preferably daylight) on the inside of the pod wall.

(3) In the case of varieties with the state “entire”, the parchment will occur as a thick layer in all pods.

Ad. 38: Excluding varieties with pod parchment: entire: Pod: thickened wall

The observations should be made on well developed pods not showing any signs of senescence. Unopened harvested pods should be cut in cross section to examine pod wall thickness.



1
absent

9
present

Ad. 39: Only varieties with Pod: thickened wall: absent: Pod: shape of distal part

Observations should be made on several nodes of each plant when pods are fully developed, but before any senescence.

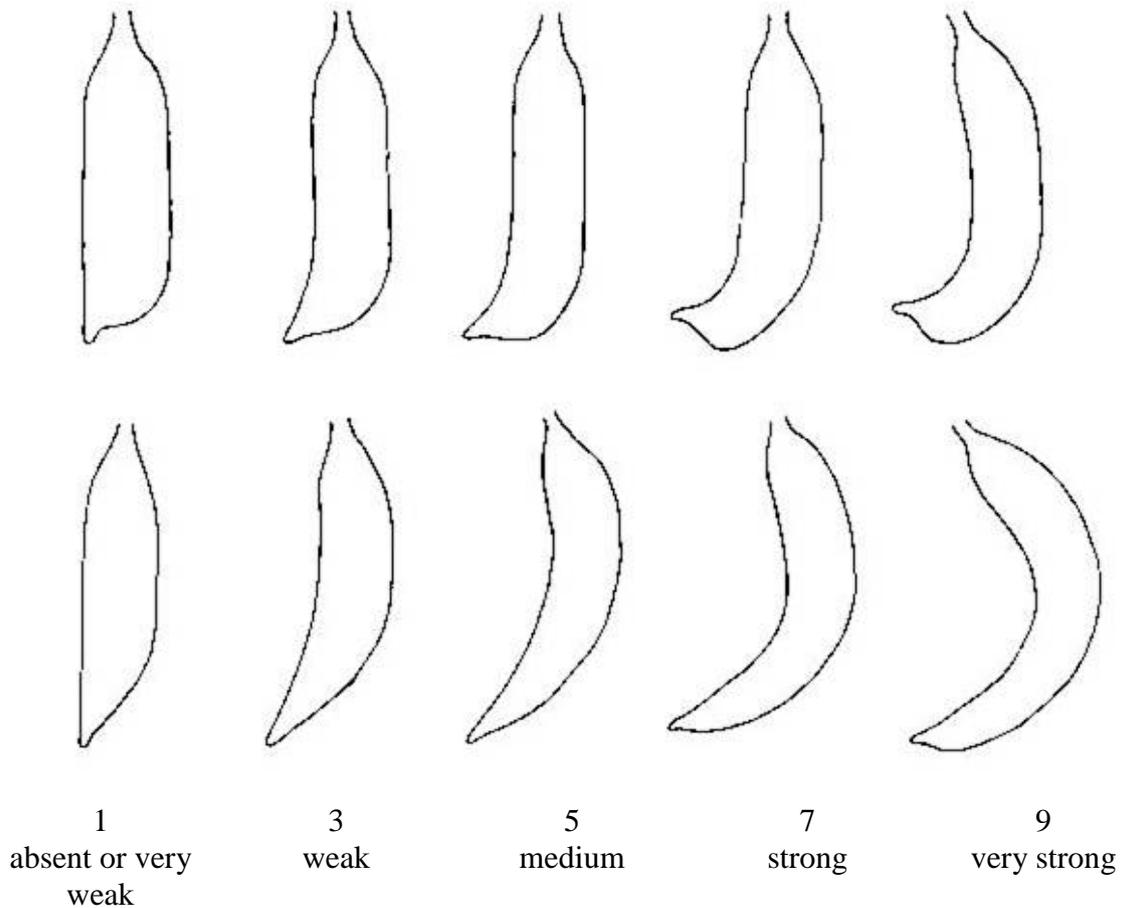


1
pointed



2
blunt

Ad. 40: Pod: curvature



Ad. 41: Pod: color

Green pods may be pale or dark, the color is correlated with pale or dark immature seed color.

Blue green pods are dark and slightly bluish. The color develops with time, and may be more accentuated in hotter, drier conditions.

Purple pods may be entirely purple or partially purple; occasionally the amount and distribution of anthocyanin may vary within the plant.

Ad. 43: Excluding varieties with pod parchment: entire: Pod: suture strings

When temperatures exceed 20°C, the formation of suture strings is delayed. Observations should be made on fully developed pods.

Varieties with rudimentary suture strings are considered as state “absent”.

Ad. 44: Pod: number of ovules

The number of ovules is best recorded when the pods are flat. The number of ovules should be observed before seed development.

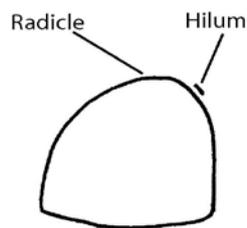
Ad. 45: Immature seed: intensity of green color

Immature seed color in some varieties with green cotyledons may appear creamy white before the seed is fully developed. Observations should be made on fully developed, fresh seed in a side-by-side comparison with example varieties.

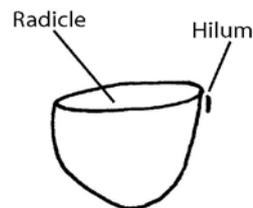
Ad. 46: Seed: shape

Seeds which grow nearest the peduncle end or the distal end of the pod ('end seeds') are rounded on the radicle or the distal (opposite to the radicle) surfaces and should be excluded before shape is assessed. 'Golf ball' and other irregular dimpling should be ignored.

Orientate the seed so that the hilum is at the upper right hand side with radicle on top.



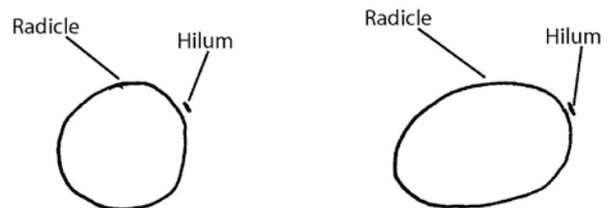
If the seed is rounded on the radicle surface only, it is an end seed growing nearest the peduncle end of the pod.



If the seed is rounded on the distal surface only, it is an end seed growing nearest the distal end of the pod.

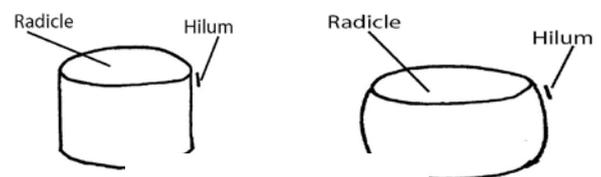
1. Ellipsoid

Seeds with no, or very weak, compression on the radicle and/or the distal surfaces



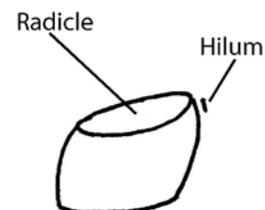
2. Cylindrical

Seeds compressed on the radicle and distal surfaces. Square to rectangular or with rounded sides in longitudinal section.



3. Rhomboid

Seeds irregularly compressed on the radicle and distal surfaces, but also irregularly compressed on the abaxial surfaces.



4. Irregular

Seeds irregularly compressed; not one of the above shapes

Ad. 53: Seed: hilum color

The hilum area should be lightly polished with a cloth before recording, to remove any loose tissue present. In varieties with plant anthocyanin present, the testa will contain tannins which vary in color from reddish brown to brown to brownish green. Where the hilum color is darker than the testa, melanin pigment is expressed as a black or dark brown color. It can be difficult to assess hilum color if the testa tannins darken with age; assessment should therefore be made within nine months of seed harvest.

Ad. 57: Seed: weight

Seed weight should be measured on at least two samples of 100 seeds. Immature and infected seeds should be excluded.