

PEA (*Pisum sativum* L.) DESCRIPTORS

III Characterisation and evaluation descriptors

Legume genetic resources evaluation methodology.

Plot size: minimum 5m², at least 3 replications, random plot layout. Seed rate: peas 100-120 seeds able to germinate per m². Non-treated seed is used.

3 year average data is transformed to 1-9 scale and used for final evaluation.

Characterization of testing location:

- a. Country of characterization
- b. Institute name and address
- c. Institute site (latitude, longitude, elevation)
- d. Sowing date
- e. Harvest date
- f. Percentage seed germination
- g. Percentage field establishment
- h. Plot size
- i. Number of replications
- j. Fertilizer (types, doses)
- k. Plant protection

ENVIRONMENT CHARACTERISTIC

- l. Soil type
- m. Relief
- n. Soil pH
- o. Soil organic matter content
- p. Soil texture
- q. Temperature range (year and/or the seasonal mean, maximum, minimum)
- r. Frost (date and lowest temperature of most recent frost)

Descriptor code	Number of trait in other descriptors	Descriptor Scale (score)	Reference values	Remarks
III/1		Seed: shape		
	² UPOV 1	1 Spherical 2 Ovoid 3 Cylindrical 4 Rhomboid 5 Triangular 6 irregular		The trait should be assessed in seeds development stage 00 (Decimal code for the growth stages of peas by UPOV)
III/2		Seed: colour of cotyledon		
	² UPOV 3	1 Green 2 yellow		The trait should be assessed in seeds development stage 00 (Decimal code for the growth stages of peas by UPOV)
III/3		Plant: anthocyanin coloration		
	UPOV 9	1 absent 2 present		The trait should be assessed in plant development stage 30-199 (Decimal code for the growth stages of peas by UPOV)
III/4		Stem: fascination		
	UPOV 11	1 absent 2 present		The trait should be assessed in plant development stage 30-199 (Decimal code for the growth stages of peas by UPOV). Scored when at least 3 nodes have flowered
III/5		Stem: length		
	UPOV 12	1 very short 3 short 5 medium 7 tall 9 very tall	<31cm 31-60 cm 61-100 cm 101-160 cm >160 cm	* The observations should be made on harvested plants at mature green seed stage 240 (Decimal code for the growth stages of peas by UPOV). Measured from the ground to the top of plant, for 5 plants per plot from each replication and the mean has calculated
III/6		Stem: number of nodes up to and including first fertile node		

	UPOV 13 ¹ Descriptor list pulses NL 3		numeric	Count downwards including 1st flowering node, not including scale node
III/7		Leaflet: dentations		
	UPOV 26	1 absent 2 present	Figure 1. Appendix	The trait should be assessed in plant development stage 30-240 (Decimal code for the growth stages of peas by UPOV) The observations should be made over the main stem above the sixth node.
III/8		Leaflet: degree of dentations		
	UPOV 27	1 Very weak 3 weak 5 medium 7 strong 9 very strong	Figure 1. Appendix	The trait should be assessed in plant development stage 30-240 (Decimal code for the growth stages of peas by UPOV) The observations should be made over the main stem above the sixth node
III/9		Stipule: type of development		
	UPOV 28	1 rudimentary 2 well developed		The trait should be assessed in plant development stage 30-240 (Decimal code for the growth stages of peas by UPOV)
III/10		Time of flowering		
	UPOV 36 Descriptor list pulses NL 1		numeric	Number of the days after emergence of seedling when 10 % of plant have begun to flower
III/11		End of flowering		
	Descriptor list pulses NL 2		numeric	Number of the days after emergence of seedling when less than 10 % of plants have flowers
III/12		Varieties with anthocyanin only: flower: anthocyanin coloration of wing		
	UPOV 38 Descriptor list pulses NL 6	1 pink blush 2 pink 3 reddish purple		The trait should be assessed in plant development stage 216-226 (Decimal code for the growth stages of peas by UPOV)

				The colour of standard should be recorded on flowers which are fully opened and fresh
III/13		Varieties without anthocyanin only: Flower: color of standard		
	UPOV 41 Descriptor list pulses NL 6	1 white 2 white to cream 3 cream		The trait should be assessed in plant development stage 216-226 (Decimal code for the growth stages of peas by UPOV) The observations should be made only on varieties without anthocyanin. The colour of standard should be recorded on flowers which are fully opened and fresh
III/14		Flower: shape of base of standard		
	UPOV 41	1 strongly raised 3 raised 5 level 7 arched 9 strongly arched	Figure 2. Appendix	The trait should be assessed in plant development stage 216-226 (Decimal code for the growth stages of peas by UPOV)
III/15		Pods per node		
	Descriptor list pulses NL 18	1 2 3 4 5 6	1 2 3 4 5 6	The trait should be assessed in plant development stage 320 (Decimal code for the growth stages of peas UPOV) Scored maximum number of pods per node average of 5 plants
III/16		Pod length		
		1 Very short 3 short 5 medium 7 tall 9 very tall	<31mm 31-50 mm 51-60 mm 61-80 mm >80 mm	The trait should be assessed in plant development stage 218-224 (Decimal code for the growth stages of peas) Measured one pod for 5 plants per plot from each replication and the mean has calculated
III/17		Pod: degree of curvature		

	UPOV 52	1 absent or very weak 3 weak 5 medium 7 strong 9 very strong	Figure 3. Appendix	The trait should be assessed in plant development stage 240 (Decimal code for the growth stages of peas) The observations should be made one pod for 5 plants per plot from each replication and the mean has calculated
III/18		Pod: type of curvature		
	UPOV 53	1 concave 2 convex	Figure 4. Appendix	The trait should be assessed in plant development stage 240 (Decimal code for the growth stages of peas) The observations should be made one pod for 5 plants per plot from each replication and the mean has calculated
III/19		Pod: number of seeds		
	UPOV 60 Descriptor list pulses NL 8	3 few 5 medium 7 many	<5 5-7 >7	The trait should be assessed in plant development stage 230-240 (Decimal code for the growth stages of peas) Scored number of ovules per pod average of 5 plants per plot from each replication and the mean has calculated)
III/20		Pod: number of ovules		
	Descriptor list pulses NL 9		numeric	The trait should be assessed in plant development stage 230-240 (Decimal code for the growth stages of peas) Scored number of ovules per pod average of 5 plants per plot from each replication and the mean has calculated
III/21		Varieties with anthocyanin only: seed: marbling of testa		
	UPOV 4	1 absent 2 present		The trait should be assessed on seeds development stage 320 (Decimal code for the growth stages of cereals by UPOV)
III/22		Varieties with anthocyanin only: seed: violet or pink		
	UPOV 5	1 absent 2		The trait should be assessed on seeds development stage 320 (Decimal code for

		3 faint intense		the growth stages of cereals by UPOV
III/23		Varieties with anthocyanin only: seed: color of testa		
	UPOV 7	1 reddish 2 brown 3 brownish green		The trait should be assessed on seeds development stage 320 (Decimal code for the growth stages of cereals by UPOV)
III/24		Seed: black colour of hilum		
	UPOV6	1 absent 2 present		The trait should be assessed on seeds development stage 320 (Decimal code for the growth stages of cereals by UPOV)
III/25		Seed: weight		
	UPOV 65 Descriptor list pulses NL 10 SIN	1 very small 3 small 5 medium 7 large 9 very large	<100 101-190 191-280 281-370 >370	* The observations should be made on two samples of 100 harvested seeds. Immature and infected seeds should be excluded; the seed should be dry (approximately 10-15% moisture content) at time of recording.
III/26		Protein content, %		
	SIN	1 very low 3 low 5 intermediate 7 high 9 very high	< 17 % 17.1-20 % 20.1-22 % 22.1-25 % >25 %	* Representative sample from all replications. Measured as percentage of dry weight The conversation factor used as either N x 6.25 Testing method should be indicated
III/27		Susceptibility to pod spot (<i>Ascoshyta pisi</i>)		
	UPOV 68 Descriptor list pulses NL 22 SIN	1 very low 3 low 5 intermediate 7 high 9 very high	< 1% 2-10 % 11-25 % 26-50% > 50% Figure 5. Appendix	The susceptibility should be assessed in plant development stage 224-240 (Decimal code for the growth stages of cereals by UPOV) *leaves for 5 plants in each replication should be estimated and mean calculated

III/28		Susceptibility to powdery mildew (<i>Erysiphe pisi</i>)		
	UPOV 68 Descriptor list pulses NL 21 SIN	1 very low 3 low 5 intermediate 7 high 9 very high	5 % 10 % 25 % 50 % > 75 % Figure 6. Appendix	The susceptibility should be assessed in plant development stage 224-240 (Decimal code for the growth stages of cereals by UPOV) *leaves for 5 plants in each replication should be estimated and mean calculated
III/29		Susceptibility to downy mildew (<i>Perenospora pisi</i>)		
	UPOV 68 Descriptor list pulses NL 20 SIN	1 very low 3 low 5 intermediate 7 high 9 very high	5 % 10 % 25 % 50 % > 75 % Figure 6. Appendix	The susceptibility should be assessed in plant development stage 224-240 (Decimal code for the growth stages of cereals by UPOV) *leaves for 5 plants in each replication should be estimated and mean calculated
III/30		Susceptibility to pulses rust (<i>Uromices ssp.</i>)		
	UPOV 68 SIN	1 very low 3 low 5 intermediate 7 high 9 very high	5 % 10 % 25 % 50 % > 75 % Figure 7. Appendix	The susceptibility should be assessed in plant development stage 224-240 (Decimal code for the growth stages of cereals by UPOV) *leaves for 5 plants in each replication should be estimated and mean calculated
III/31		Cytological characteristics and identified genes		
III/32		Molecular markers		
III/33		Pictures		
III/34		Cytological characteristics and identified genes		

Explanations and references

* Trait estimation according ‘Legume genetic resources evaluation methodology’

¹ Descriptor list pulses NL, 1986

² UPOV – DUS test guidelines, Pas 1/3, 1989,

³ SIN protocol

Guidlines for the conduct of tests for distinctness, homogeneity and stability. Peas TG/7/9, 1994-11-04.
Descriptor list pulses NL, 1986

Appendix

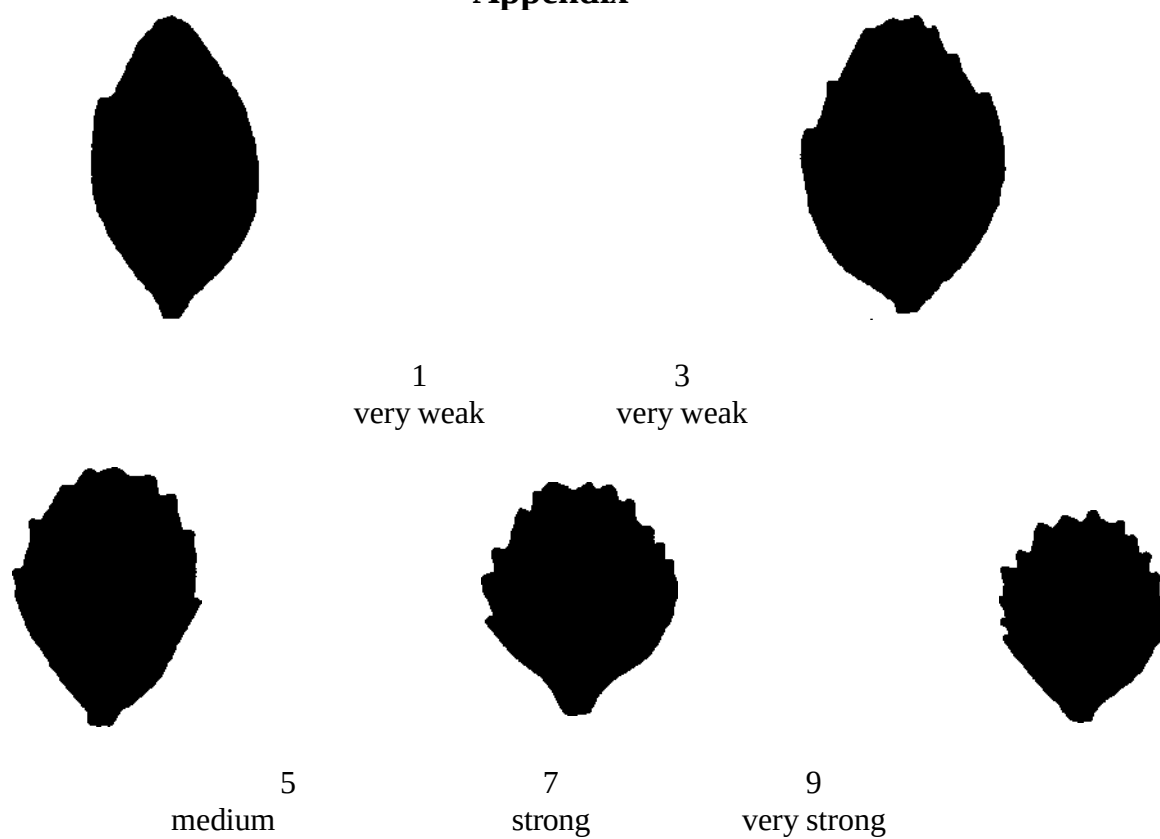


Figure 1. **Leaflet: dentation (III/6) and degree of dentation (III/7)**

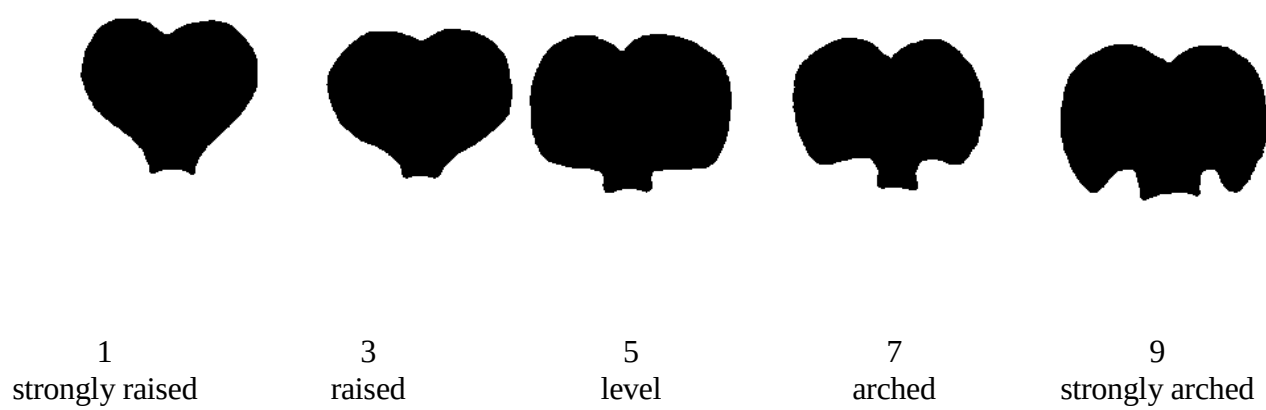


Figure 2. **Flower: shape of base of standard**

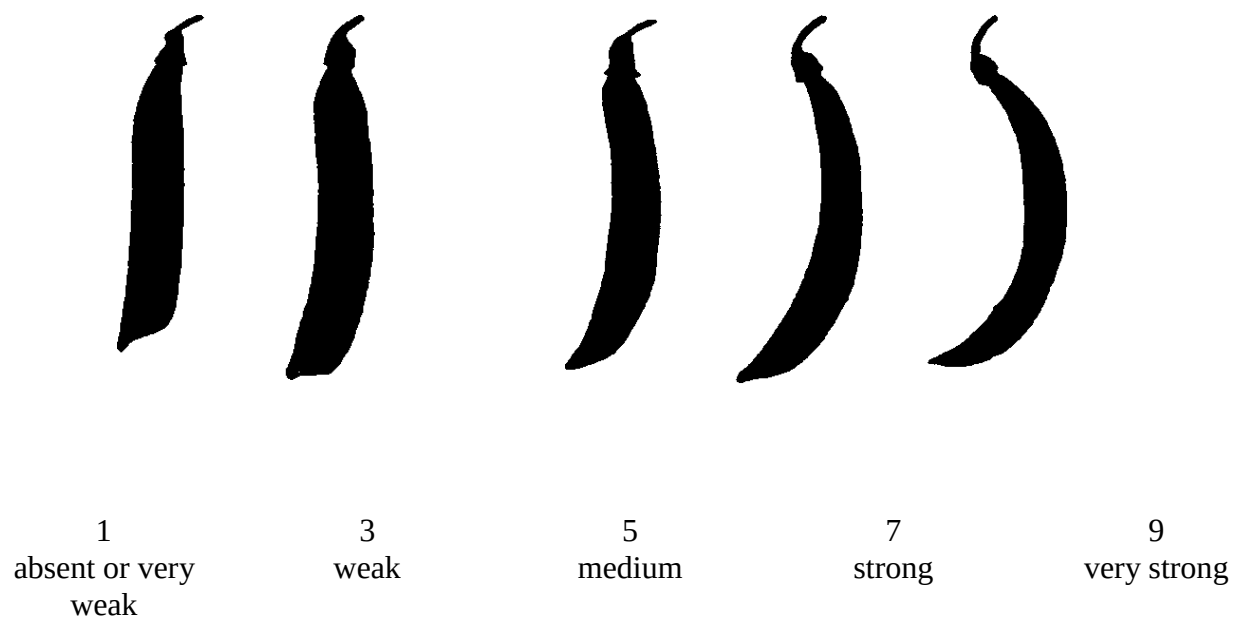


Figure 3. **Pod: degree of curvature**

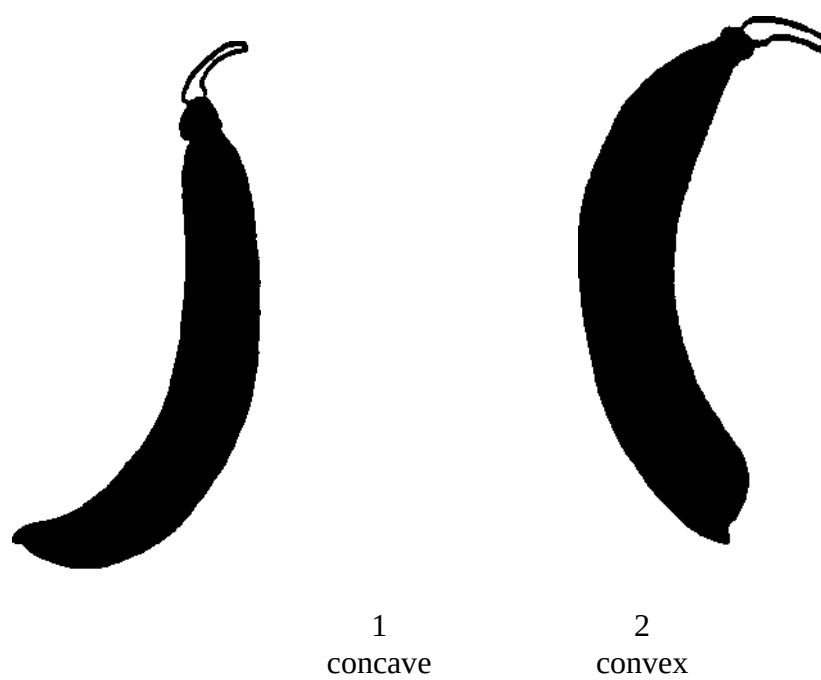
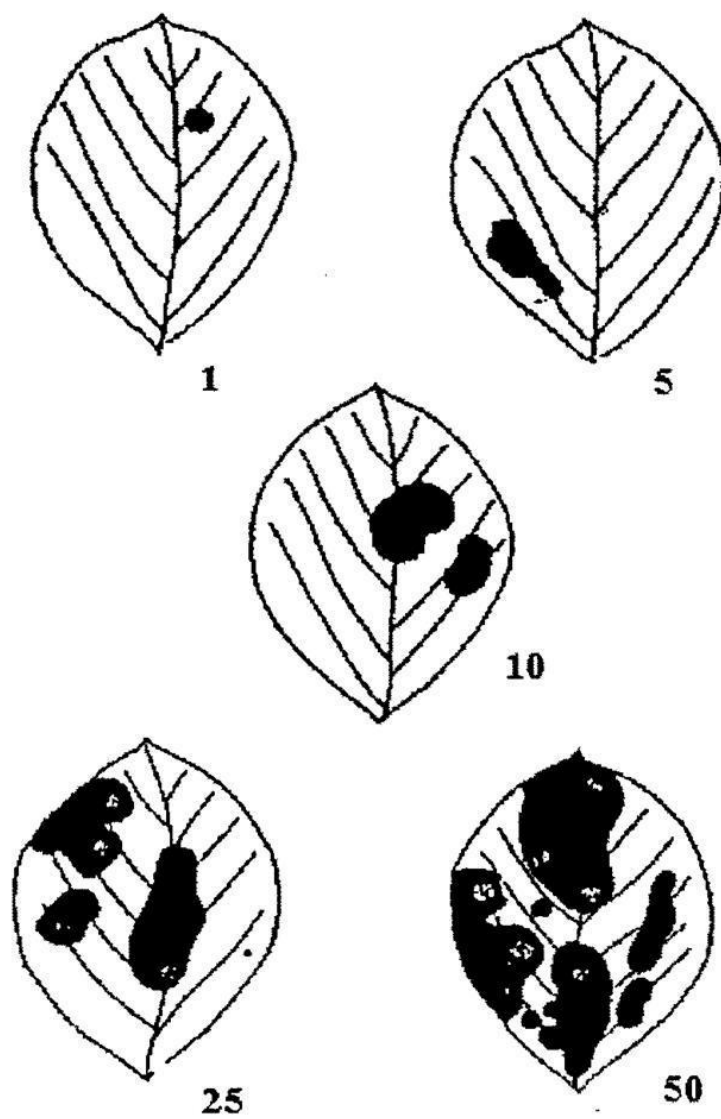


Figure 4. **Pod: type of curvature**



1
very low

3 low

5 intermediate

7 high

9 very high

Figure 5. Susceptibility to pod spot (*Ascoshyta pisi*)

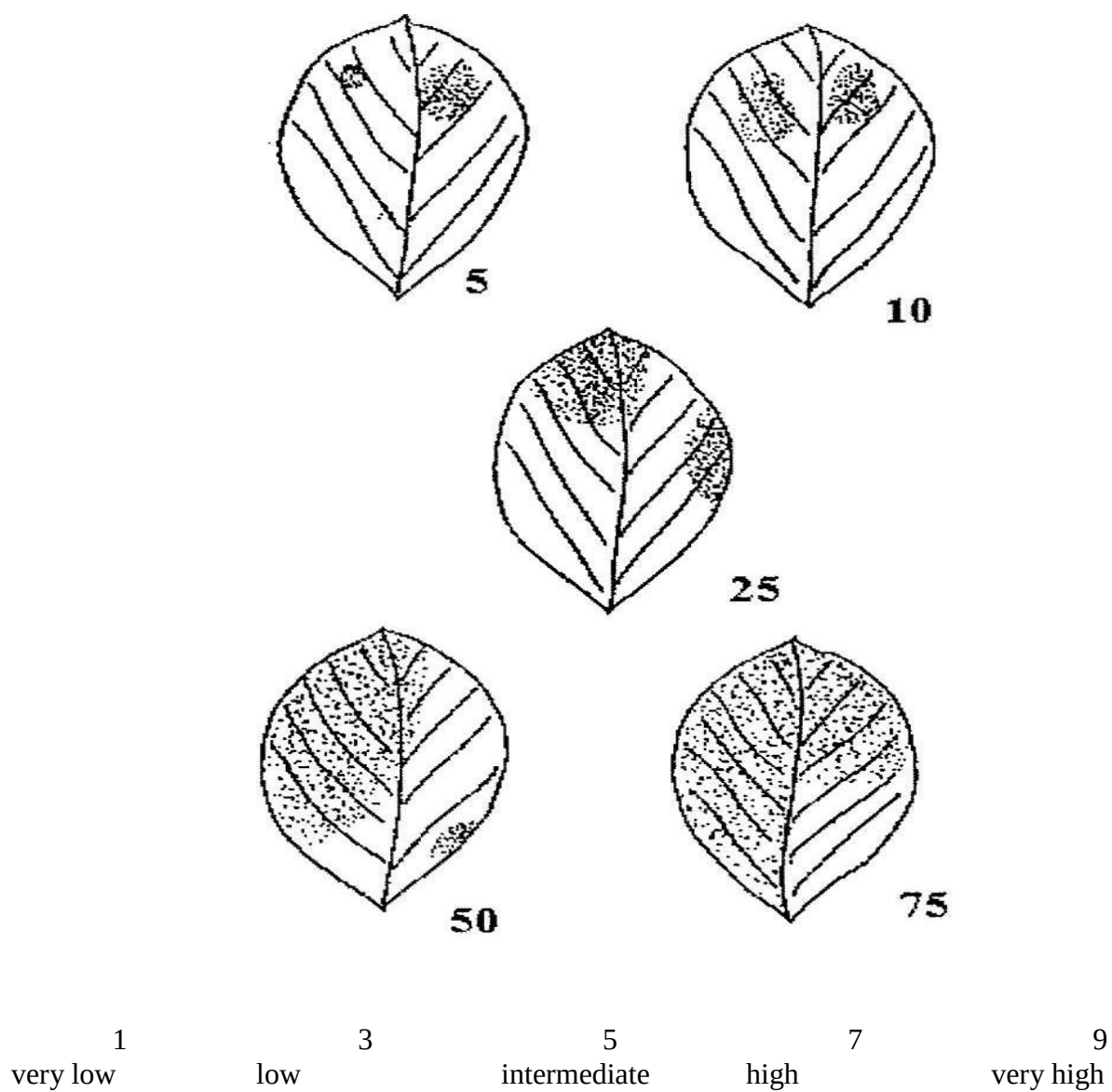
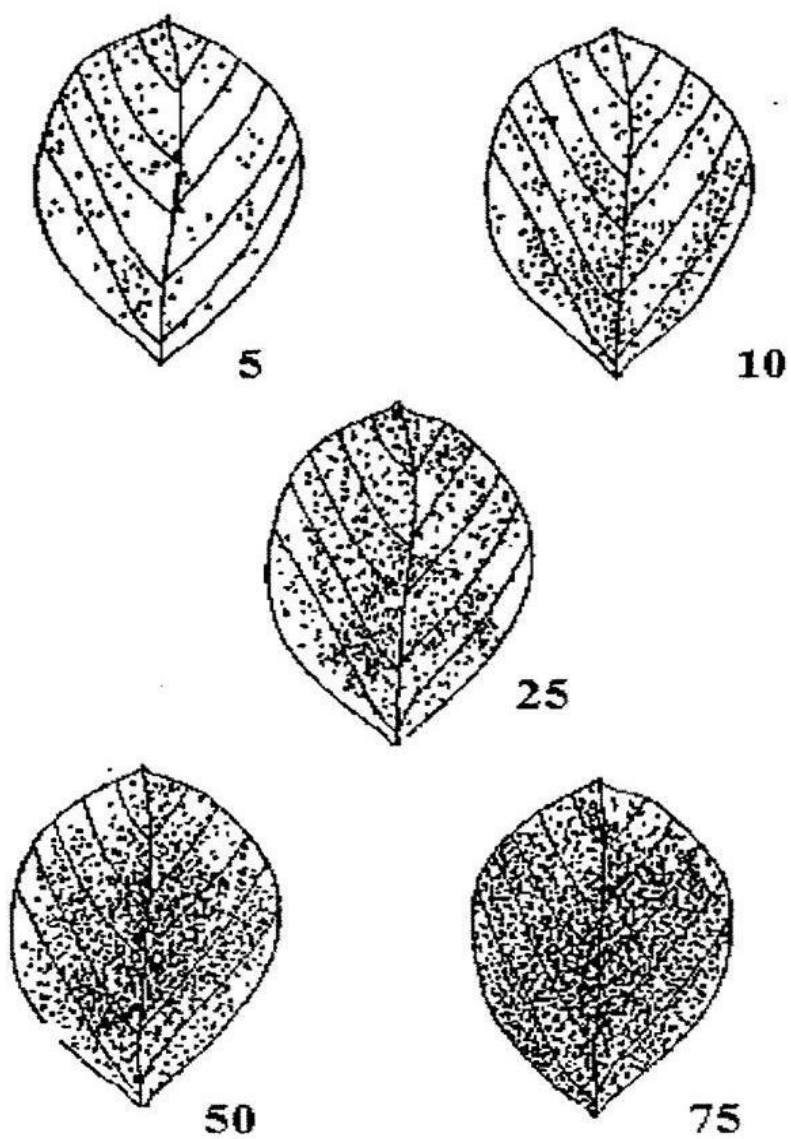


Figure 6. Susceptibility to downy mildew (*Perenospora pisi*) and powdery mildew (*Erysiphe pisi*)



1
very low

3
low

5
intermediate

7
high

9
very high

Figure 7. Susceptibility to pulses rust (*Uromices* spp.)