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**CATEGORIES OF CHARACTERISTICS WITH REGARD TO THEIR STATES OF
EXPRESSION**

Document prepared by experts from South Africa

The present document has been prepared at the request of the Technical Working Party for Fruit Crops (TWF). It is only a preliminary document which will require further completion and refinement. The TWF, however, has decided to already present it to the Technical Committee (see TWF/27/18, paragraph 28) for information and consideration of possible steps to be taken.

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INTRODUCTION

Document TC/26/4 Rev. served as a basis for establishing categories for the different types of characteristics and practically all examples have been taken from TC/26/4 Rev. and TC/27/5. A few examples have been included from TWF Test Guidelines adopted in 1995 (see TWF/27/16). Reference was also made to TG/1/2, TWV/29/7 and TWV/30/20.

This document has not yet been completed. It still needs to be refined and various explanations (e.g. from TC/26/4 Rev.) as well as more problematic examples from Test Guidelines of other Working Parties still need to be included.

The categories are not strictly exclusive but are formulated just to give some guidance in deciding on the different options for the states of expression. It is important always to first observe the plant, note down the most appropriate wording, compare the wording with examples under the different categories, and to decide whether it fitted or whether a different wording should be chosen. Throughout the process the applicability of the wording to the particular situation in the given plant group should be ensured. Test Guidelines are prepared to fit specific genera or species and not the other way round.

RULES FOR QUALITATIVE AND QUANTITATIVE CHARACTERISTICS

Qualitative characteristics

True qualitative characteristics should show discrete discontinuous states of expression with no arbitrary limit on the number of states.

- The states are classified by consecutive numbers, starting with Note 1.
- As far as it is possible to build up an order for the expressions, the smaller, lesser or lower expressions should be assigned the lower Notes.
- When each state of expression corresponds to a whole number under 10, the respective figure should be used for the Note. Example: ploidy: diploid (2), tetraploid (4).
- The same wording should not be allowed more than once for a particular characteristic (e.g. ovate (1), intermediate (2), elliptic (3), intermediate (4), round (5)).

Quantitative characteristics

Quantitative characteristics are measurable on a one-dimensional scale and show continuous variation from one extreme to the other.

- As a general rule, a reasonable word pair is chosen for the weak and strong expression (Notes 3 and 7).
- Note 5 should represent the medium state within the whole range of variation.
- Extreme states should be given the Notes 1 and 9.

- It is not always necessary to indicate the full 1 - 9 scale in the Test Guidelines. It may be sufficient to indicate only states 3,5,7 or 1,3,5,7,9. The Editorial Committee stressed in 1995 that it should be possible to give each state of expression a wording, even those that are not mentioned in the Test Guidelines. In cases where the wording of the states is unclear or leaves several possibilities open, it is preferable to also specify the wording of the states with even Notes to ensure use of the same wording by everybody. (Comment: If this is harmonised it should not be necessary to list all states.)
- States of expression should be given symmetrically.
- For measured characteristics, each step between the Notes should be of the same size and the difference between two Notes should represent at least one LSD.
- Higher Notes should represent higher values where the characteristic concerned is related to value.

(Adapted from TC/26/4 Rev.)

1. QUALITATIVE CHARACTERISTICS WITH DISCRETE DISCONTINUOUS STATES OF EXPRESSION

(a) True qualitative characteristics

There are not many true qualitative characteristics. Some of the examples listed under category 2a may also belong here, however, in cases where a continuous variation does not occur.

Examples

- Ex.1: sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite (4)
- Ex.2: ploidy: diploid (2), tetraploid (4)
- Ex.3: embryony: mono-embryonic (1), poly-embryonic (2)
- Ex.4: formation: concentric (1), stoloniferous (2), rhizomatous (3)
- Ex.5: ploidy: diploid (2), tetraploid (4)
- Ex.6: ploidy: diploid (2), tetraploid (4), hexaploid (6), octoploid (8)
- Ex.7: position: frontal (1), clamping (2)
- Ex.8: female (1), male (2), hermaphrodite (3)

(b) Characteristics that have fixed numerical ranges in their states of expression

These characteristics have to be presented qualitatively as by the definition of the states they are discrete and discontinuous.

Examples

- Ex.9: number of flowers: usually one (1), one to three (2), usually three (3)
- Ex.10: less than seven (1), between seven and ten (2), more than ten (3)
- Ex.11: always one (1), sometimes more than one (2), always more than one (3)

- Ex.12: disposition: solitary (1), in pairs (2)
 Ex.13: once flowering (1), more than once flowering (2)
 Ex.14: usually one (1) one to three (2), usually three (3)
 Ex.15: less than seven (1), seven to ten (2), more than ten (3)
 Ex.16: always one (1), sometimes more than one (2), always more than one (3)
 Ex.17: number: absent (1), one (2), two (3), more than two (4), variable (5)
 Ex.18: only two (1), two and three (2), only three (3), three and four (4), only four (5), two, three and four (6)
 Ex.19: response group: < 9 weeks (1), 9 weeks (2), 10 weeks (3), 11 weeks (4), 12 weeks (5), > 12 weeks (6)
 Ex.20: whorls: one (1), two (2), three (3)
 Ex.21: absent (1), one zone (2), more than one zone (3)
 Ex.22: color: colorless (1), single colored (2), bicolored (3), multicolored (variegated) (4)

2. CHARACTERISTICS EXPRESSED QUALITATIVELY BUT HAVING THE POSSIBILITY OF CONTINUOUS VARIATION BETWEEN THE STATES OF EXPRESSION

- (a) Characteristics with only two states of expression which could possibly be linked through continuous variation

Question of intermediate states

When preparing these characteristics, one should always consider whether it would be more reasonable to include an intermediate state. Such a characteristic would then belong under category 2d:

- Ex.23: aperture of eye: closed (1), open (2)
 Category 2d: closed (1), slightly open (2), wide (fully) open (3)

Another option would be to follow the characteristic by a second, quantitative, characteristic:

- Ex.24: flat (1), twisted (2)
 Category 4a: degree of twisting: weak (3), medium (5), strong (7)

- Ex.25: type of flower: single (1), double (2)

If it is thought more reasonable to have an intermediate state “semi-double” this could be classified under category 2d.

Proposal from TWF members

A general rule could be that all characteristics should preferably have more than two states of expression to provide for in-between situations, unless the characteristic is clearly

qualitative and no in-between states exist. Even when followed by a second characteristic expressing different degrees, the first state should be a clear, genetically based situation. This should also account for absent / present characteristics under category 4b. In order to clarify the degree of presence, the 1 - 9 scale may be used in a following, separate characteristic. In cases where the absence is not clear only a single characteristic should be used with the first state "absent or very weak."

Examples

- Ex.26: variegation: apical (1), scattered (2)
- Ex.27: venation: not flabellate (1), flabellate (2)
- Ex.28: flat (1), undulating (2)
- Ex.29: crenate (1), serrate (2)
- Ex.30: on base only (1), on upper third only (2)
- Ex.31: shape: simple (1), compound (2)
- Ex.32: similar (1), clearly different (2)
- Ex.33: symmetric (1), asymmetric (2)
- Ex.34: gradual (1), abrupt (2)
- Ex.35: type: single (1), compound (2)
- Ex.36: type: indeterminate (1), determinate (2)
- Ex.37: discontinuous (1), continuous (2)
- Ex.38: color shade: dull (1), bright (2)
- Ex.39: compactness: loose (1), compact (2)
- Ex.40: contrast /depression: inconspicuous (1), conspicuous (2)
- Ex.41: crenation: simple (1), double (2)
- Ex.42: one flower per stem (1), miniature spray (2)
- Ex.43: development: incomplete (rudimentary) (1), complete (normal) (2)
- Ex.44: direction: towards ventral part (base) (1), towards dorsal part (apex) (2)
- Ex.45: flowering habit: discontinuous (1), continuous (2)
- Ex.46: form: closed (1), open (2)
- Ex.47: deciduous (1), evergreen (2)
- Ex.48: position: adpressed (1), free (2)
- Ex.49: towards middle (1), towards base (2)
- Ex.50: position: mainly on spurs (1), mainly on brindilles (2)
- Ex.51: presence: absent or rudimentary (1), well developed (2)
- Ex.52: up-folded (folded upwards) (1), flat (2)
- Ex.53: not prominent (1), prominent (2)
- Ex.54: regular (1), irregular (2)
- Ex.55: self-colored (1), not self-colored (state color) (2)

(b) Characteristics with more than two states of expression in a non-linear or combined non-linear and linear range and having the possibility of continuous variation

All cases where the variation is non-linear are presented qualitatively even though they may express a continuous variation, because of the difficulty to establish a sequence of equidistant states with the moderate expression in the middle.

Inclusion of intermediate states

If it is more reasonable to make a further differentiation between the states of expression, intermediate states could be included as follows:

- Ex.56: color: green (1), yellow (2), orange (3), red (4), purple (5)
 Ex.57: green (1), yellow green (2), yellow (3), orange yellow (4), orange (5), red (6), purple (7)
- Ex.58: shape: round (1), elliptic (2), ovate (3)
 Ex.59: round (1), round to elliptic (2), elliptic (3), elliptic to ovate (4), ovate (5)
- Ex.60: attitude: climbing (1), erect (2), spreading (3)
 Ex.61: climbing (1), slightly climbing (2), erect (3), slightly spreading (4), spreading (5)

Examples

- Ex.62: leaf: color of blade: yellow green (1), reddish (2), light green (3), medium green (4), dark green (5)
 Ex.63: shape: elliptic (1), round (2), oblate (3), ovate (4), obovate (5)
 Ex.64: light green (1), dark green (2), yellow green (3)
 Ex.65: light green (1), medium green (2), dark green (3), blue green (4), purple green (5)
 Ex.66: structure: slightly grooved (1), moderately grooved (2), strongly grooved (3), embossed (4)
 Ex.67: arrangement: one row (1), zig-zag (2), two rows (3), irregular (4)
 Ex.68: distribution: regular (1), in regularly distributed clusters (2), in clusters just under leaf base (3), irregular (4)
 Ex.69: type of incision of margin: crenate (1), serrate (2), dentate (3)
 Ex.70: sinuate (1), crenate (2), dentate (3), serrate (4)
 Ex.71: particularities: none (1), petiole sinus often limited through nerves at petiole end (2), often a tooth on the margin (3)
 Ex.72: color pattern: in small patches (1), linear (2), netted (3)
 Ex.73: type of pubescence: prickled (1), silky (2), tufted (3), woolly (4)
 Ex.74: type: dwarf rose (1), bed rose (2), climbing rose (3)
 Ex.75: solid flush (1), striped (2), mottled (3)
 Ex.76: one-colored (1), edged (2), striated (3), speckled (4), striated - speckled (5), shaded off (6), irregularly marked (7), flushed (8)
 Ex.77: flavor: insipid (1), aromatic (2), aniseed (3), other flavors (4)
 Ex.78: lobing: digitate (1), palmate (2), pinnate (3)
 Ex.79: smooth (1), pubescent (2), prickled (3)
 Ex.80: shape: tapering (1), parallel-sided (2), semi-clavate (3), clavate (4), fusiform (5)
 Ex.81: sloping (1), rounded (2), straight (3), elevated (4), elevated with 2nd beak present (5)
 Ex.82: disposition: horizontal (1), domed (2), cylindrical (3)

(c) Characteristics with individual and combined states of expression

These are characteristics containing two or more individual expressions and one or more combinations. In these characteristics a continuous variation either does not exist or intermediates are not recognized. If it should be more reasonable to recognize intermediates such a characteristic may rather be spilt into two or more separate characteristics.

Examples

- Ex.83: adherence: to embryo (1), to flesh (2), to neither (3)
- Ex.84: basal branching (1), top branching (2), fully branched with central head (3), fully branched without central head (4)
- Ex.85: only green (1), only purple (2), green and purple (3)
- Ex.86: glucosides: monoglucosides (1), diglucosides (2), monoglucosides and diglucosides (3)
- Ex.87: ornamentation: absent (1), only diffuse (2), only pronounced (3), partly diffuse and partly pronounced (4)
(Could rather have had a separate characteristics for absent / present.)
- Ex.88: marbling (1), dotting (2), marbling and dotting (3)
- Ex.89: position: below middle (1), in middle (2), above middle (3), along most of its length (4)
- Ex.90: deeper at base (1), deeper at apex (2), constant (3)
- Ex.91: stone: relief of surface: small pits (1), large pits (2), grooves (3), pits and grooves (4)
- Ex.92: color type: self-colored (1), chromatic self only (2), bicolored only (3), chromatic self and bicolored (4)
- Ex.93: color pattern: self-colored (1), striped (2), maculate (3), striped and maculate (4)
- Ex.94: all white (1), all green (2), some white and some green (3)
- Ex.95: disposition: one-flowered (1), clustered (2), one-flowered and clustered (3)
- Ex.96: in dots only (1), in patches only (2), in dots and patches (3)
- Ex.97: at base only (1), at distal part only (2), evenly distributed (3)
- Ex.98: type of mottling: only diffuse (1), diffuse and in patches (2), diffuse and in linear bands (3), diffuse, in patches and linear bands (4)
- Ex.99: vestiture: hairs only (1), prickles only (2), hairs and prickles (3)
- Ex.100: not resistant (1), resistant to all known races (2), resistant to one or several races (3) (category 2d ?)
- Ex.101: seasonal type: winter type (1), spring type (2), alternative type (3)
- Ex.102: not resistant (1), resistant (2), tolerant (3) (category 2d ?)
- Ex.103: female flowers only (1), female and male flowers (2), female, male and hermaphrodite flowers (3)
- Ex.104: only plants with female flowers (1), plants with female and male flowers (2), plants with male flowers and plants with male flowers with styles (3), only plants with male flowers with styles (4), only plants with male flowers without style rudiments (5)
- Ex.105: flowering habit: once flowering (1), twice flowering (2), almost continuously flowering (3)

(d) Abbreviated qualitative presentation of linear quantitative characteristics without a fixed balancing point in the middle of the scale

This category is useful for cases where it is difficult to distinguish more than the two extreme states and a “grey area” in between. (On the full quantitative scale there would be distinctness between state 1 and 7 but not between 1 and 5.) This category is mainly the abbreviated qualitative form of category 4b and in a few cases of category 4a. In all the examples listed below, state 1 could read “absent or very weak” in its different versions for cases that do not have a clear absence (non-undulate to very slightly undulate (1), flat to very slightly convex (1), straight to very slightly curved (1), non-adherent to very slightly adherent (1), absent to very occasionally present (1), etc.)

Question

Could these characteristics be presented quantitatively with the Notes 1,5 and 9 for cases where further differentiation is expected at a later stage ? State 5 could then be “moderately expressed” in its different forms. Such a characteristics would then be classified under category 4b and 4a.

Example 106 would then be: adpressed (1), moderately held out (5), strongly held out (9), and this could, if necessary, be expanded to: adpressed or very slightly held out (1), very slightly held out to slightly held out (2), slightly held out (3), slightly held out to moderately held out (4), moderately held out (5), moderately held out to strongly held out (6), strongly held out (7), strongly held out to very strongly held out (8), very strongly held out (9).

It would mostly be absurd to extend such a characteristic to the full quantitative scale and that is why the abbreviated scale (1,2,3 or possibly 1,5,9) is useful. (This extended example is just given to indicate the wording.)

Examples

Ex.106: adpressed (1), slightly held out (2), strongly held out (3)

Ex.107: absent or very weakly expressed (1), weakly expressed (2), strongly expressed (3)

Ex.108: closed (1), partly open (2), fully open (3)

Ex.109: flat (1), slightly pointed (2), strongly pointed (3)

Ex.110: attitude: upwards (1), slightly outwards (2), strongly outwards (3)

Ex.111: type of flower: single (1), semi-double (2), double (3)

Ex.112: non-undulate (1), slightly undulate (2), strongly undulate (3)

Ex.113: flat (1), slightly convex (2), clearly convex (3)

Ex.114: straight (1), slightly curved (2), strongly curved (3)

Ex.115: non-adherent (1), semi-adherent (2), fully adherent (3)

Ex.116: absent (1), occasionally present (2), always present (3)

Ex.117: distribution: even (1), slightly uneven (2), strongly uneven (3)

Ex.118: hollow (1), semi-solid (2), solid (3)

Ex.119: attitude: erect (1), semi-prostrate (2), prostrate (3)

Ex.120: persistence: none (1), partial (2), total (3)

- Ex.121: non-adherent (1), semi-adherent (2), fully adherent (3)
Ex.122: self-compatibility: absent (1), partial (2), complete (3)
Ex.123: curvature: straight (1), slightly curved (2), strongly curved (3)
Ex.124: absent (1), partly developed (2), fully developed (3)
Ex.125: fully exposed (1), somewhat concealed (2), fully concealed (3)
Ex.126: distribution: even (1), slightly uneven (2), strongly uneven (3)
Ex.127: flower type: single (1), semi-double (2), double (3)
Ex.128: frequency: absent (1), partial (2), complete (3)
Ex.129: growth type: indeterminate (1), semi-determinate (2), determinate (3)
Ex.130: hairiness: absent or very slightly hairy (1), slightly hairy (2), strongly hairy (3)
Ex.131: incisions: absent (1), fine (2), coarse (3)
Ex.132: intensity: absent or very faint (1), faint (2), intense (3)
Ex.133: unilateral (1), sub-equilateral (2), equilateral (3)
Ex.134: persistence: none (1), partial (2), total (3)
Ex.135: position: adpressed (1), slightly held out (2), markedly held out (3)
Ex.136: presence: absent (1), occasionally present (2), always present (3)
Ex.137: always absent (1), sometimes present (2), always present (3)
Ex.138: not remontant (1), partially remontant (2), fully remontant (3)
Ex.139: secondary serration: absent to very occasional (1), occasional (2), always present (3)
Ex.140: shape: flat (1), slightly convex (2), clearly convex (3)
Ex.141: shape of tip: blunt (1), slightly pointed (2), pointed (3)
Ex.142: smooth (1), slightly ridged (2), strongly ridged (3)
Ex.143: symmetric (1), slightly asymmetric (2), clearly asymmetric (3)
Ex.144: smooth (1), slightly rough (2), rough (3)
Ex.145: absent (1), partial (2), complete (3)
Ex.146: type of flower: single (1), semi-double (2), double (3)
Ex.147: not undulate (1), slightly undulate (2), markedly undulate (3)
Ex.148: dull (1), slightly glossy (2), glossy (3)
Ex.149: appearance: closed (1), clustered (2), open (3)
(The wording on the 1 - 9 scale would be: closed or very clustered (1), clustered (3), intermediate (5), open (7), very open (9) - see category 4b.)
Ex.150: flat (1), undulated (2), folded (3)
Ex.151: growth type: indeterminate (1), semi-determinate (2), determinate (3)

(e) Abbreviated qualitative presentation of linear quantitative characteristics with a fixed balancing point in the middle of the scale

This category is the abbreviated qualitative form of category 4c and is useful for cases where it is more reasonable to recognize only three states of expression. In the following example, for instance, it is not important to know how far below or above, but only whether it is below, same height, or above:

- Ex.152: below (1), same height (2), above (3)

Question

Could these characteristics be presented quantitatively, with the Notes 1,5 and 9 ? (See question under category 2d.)

Examples

- Ex.153: concave (1), flat (2), convex (3)
 Ex.154: depressed (1), flat (2), pointed (3)
 Ex.155: upwards (1), outwards (2), downwards (3)
 Ex.156: attitude: upwards (1), horizontal (2), downwards (3)
 Ex.157: lighter (1), same (2), darker (3)
 Ex.158: diameter: smaller (1), equal (2), larger (3)
 Ex.159: shorter (1), equal (2), longer (3)
 Ex.160: free (apart) (1), touching (2), overlapping (3) (Under category 4c it would have read: far apart (1), apart (3), touching (5), overlapping (7), strongly overlapping (9) or: states 1 and 9 could read “very”)
 Ex.161: towards blossom end (1), at centre (2), towards stem end (3)
 Ex.162: below (1), same level (2), above (3)
 Ex.163: in a basin (1), level (2), set above fruit (3)
 Ex.164: position: marginal (1), median (2), basal (3)
 Ex.165: hollow (1), flat (2), pointed (3)
 Ex.166: size relative to : smaller (1), same size (2), larger (3)
 Ex.167: earlier (1), same time (2), later (3)
 Ex.168: before (1), simultaneous (2), after (3)

3. CHARACTERISTICS THAT MEET ONLY SOME OF THE REQUIREMENTS FOR THE TYPICAL QUANTITATIVE EXPRESSION

These are characteristics with states of expression in a linear range and in which a continuous variation may be possible, but which deviate from the norm for quantitative characteristics in one or more aspects.

These characteristics may present difficulties in the choice of qualitative or quantitative expression. Because they are linear one is inclined to make them quantitative, but the frequent lack of a “medium” state makes the typical symmetrical arrangement difficult. To meet the requirements for quantitative expression, it would be advisable to give the states a symmetric arrangement around a medium state (5) (named “medium,” intermediate” or “moderately ...”), even though some of these states may not actually exist in the particular genus or species. If one of the states could be suitable as a fixed balancing point (e.g. “round”), this should be state 5 with the other states symmetrically arranged on either side. Otherwise, one could ignore the requirements for symmetry and treat the characteristic as qualitative.

- Ex.169: angle: narrow acute (1), acute (3), intermediate (medium) (5), obtuse (7), broad obtuse (9) (This is in agreement with category 4a.)

Worded in the following way, it is in agreement with category 4c: narrow acute (1), acute (3), approximately right angle (5), obtuse (7), broad obtuse (9) (For angles the prefixes - “narrow” and “broad” are preferable to “very.”)

With the following asymmetric arrangement this example should rather be treated qualitatively: acute (1), approximately right angle (2), obtuse (3), broad obtuse (4)

The use of the terms “intermediate” or “medium” should be avoided for qualitative characteristics because, from the description of the variety, one would not know the meaning of these terms.

Ex.170: elliptic (3), round (5), oblate (7)

Ex.171: narrow elliptic (1), elliptic (2), round (3)

Ex.172: elliptic (1), round (2), oblate (3), flat oblate (4)

Ex.173: narrow elliptic (1), elliptic (3), round (5), oblate (7), flat oblate (9)

Examples (170) and (173) have a symmetric arrangement of states on either side of “round” which could be regarded as a fixed balancing point in the middle. However, as shown in examples (171) and (172), the state “round” could move to the right or left and will no longer be in the middle.

Ex.174: narrow elliptic (3), elliptic (5), broad elliptic (7)

This should rather read: width: narrow (3), medium (5), broad (7), since all states are elliptic. Now it belongs under category 4a.

Question

Considering the problems in this category, would it be simpler to treat all of these characteristics as qualitative unless they meet the requirements for symmetry? If intermediate states are required, they could merely be inserted between the consecutive qualitative states. Examples: to insert “yellow green” and “green yellow” between “green” and “yellow” or “fastigate to upright” between “fastigate and upright.”

Color

Color is always expressed qualitatively, whether linear or non-linear, unless it is a case of different intensities of a single color which would put the characteristic under category 4a.

Ex.175: yellow (1) green yellow (2), yellow green (3), green (4)

(Category 4a: intensity of green color: light (3), medium (5), dark (7))

Shapes and angles

Shapes not in a linear range belong under category 2b. The states of the following characteristics all form a linear range:

- Ex.176: acute (1), obtuse (2), rounded (3), truncate (4), emarginate (5)
 Ex.177: pointed (1), rounded (2), flattened (3)
 Ex.178: acute (3), broad acute (4), obtuse (5), broad obtuse (6), straight (flat, truncate) (7) (To be qualitative ? If intermediates are required, they could be “acute to broad acute,” etc.)
 Ex.179: ovate (1), elliptic (2), obovate (3)
 Ex.180: shape of base: straight (1), very open (2), open (3), slightly open (4), closed (5), overlapping (6)
 Ex.181: shape of base: pointed (1), rounded (2), flattened (3)
 Ex.182: shape of apex: pointed (1), pointed to rounded (2), rounded (3)
 Ex.183: flat saucered (1), saucered (3), flat cupped (5), cupped (7), deep cupped (9)
 Normally the wording of state 5 would be “intermediate” in this quantitative presentation.

Position and distribution

- Ex.184: position: on the upper third (1), on the upper half (2), over the whole length (3)
 Ex.185: distribution: tip only (1), upper quarter (2), upper half (3), upper two-thirds (4), whole length (5)

Resistance

- Ex.186: not resistant (1), resistant to one or several races (2), resistant to all races (3) (category 2d ?)
 Ex.187: not resistant 1), tolerant (2), resistant (3) (category 2d ?)

Presence

- Ex.188: presence: always absent (1), often absent (2), variably present (3), often present (4), always present (5)

Curvature

- Ex.189: straight (1), recurved (2), rolled (3)

Season

- Ex.190: season of flowering: autumn (1), winter (2), spring (3), summer (4)

Structure

- Ex.191: hollow (3), semi-hollow (5), solid (7) This should rather read: hollow (1), semi-hollow (3), intermediate (5), semi-solid (7), solid (9)
 The typical category 4a wording is perhaps not appropriate in this case: very hollow (1), hollow (3), intermediate (5), solid (7), very solid (9). There

are other cases as well where the word “very” does not fit either or both extreme states.

Growth habit

- Ex.192: erect (1), semi-erect (3), medium (5), semi-prostrate (7), prostrate (9)
Should rather read: upright (1), semi-upright (3), intermediate (5), semi-prostrate (7), prostrate (9) (TWF: “erect” is normally used for part of a plant, while “upright” is used for the whole plant.)
- Ex.193: narrow bushy (1), bushy (3), broad bushy (5), flat bushy (7), creeping (9)
(State 3 should rather read “medium bushy.” Rather qualitative ?)
- Ex.194: upright (1), bushy (2), spreading (3)
- Ex.195: plant habit: globose (1), flat globose (2), flat (3)
- Ex.196: upright (1), pendulous (2)
- Ex.197: fastigiate (1), upright (3), spreading (5), drooping (7), weeping (9)
- Ex.198: very upright (1), upright (3), semi-upright (5), spreading (7), drooping (9)
(Not symmetric.)
- Ex.199: upright (1), semi-upright (3), spreading (5), drooping (7), weeping (9)
- Ex.200: columnar (1), fastigiate (3), upright (5), semi-upright (7), spreading (9) (Not symmetric.)

Attitude in relation to plant parts

- Ex.201: attitude of hairs on petiole: upwards (1), slightly outwards (2), strongly outwards (3) (This falls under category 2d.)
- Ex.202: leaf: attitude in relation to shoot: upwards (1), outwards (2), downwards (3), (This falls under category 2e.)
- Ex.203: leaf: attitude in relation to shoot: upwards (3), outwards (5), downwards (7)
(This falls under category 4c.)
- Ex.204: attitude: adpressed (1), oblique (3), perpendicular (5), recurved (7), strongly recurved (9)
- Ex.205: attitude of calyx segments: clasping (1), spreading (2), reflexed (3)

Attitude in relation to soil level

The TWV proposed in 1995 that the states for attitude (in relation to soil level) be fixed, independent of whether the full scale is represented, thereby allowing an asymmetrical distribution of the states of expression. (In quantitative characteristics the distribution is normally symmetrical around the moderate expression, state 5). The proposed full scale is the following:

- Ex.206: erect (1), erect to semi-erect (2), semi-erect (3), semi-erect to horizontal (prostrate) (4), horizontal (prostrate) (5), horizontal to semi-drooping (horizontal to semi-pendulous) (6), semi-drooping (semi-pendulous) (7), semi-drooping to drooping (semi-pendulous to pendulous) (8), drooping (pendulous) (9)

According to this proposal the following asymmetrical possibilities would be allowed : 1,3,5 or 1,2,3,4 or 1,2,3,4,5 or 1,3,5,7 etc.

Problem

One problem with asymmetric quantitative characteristics beginning with state 1 is that one cannot judge, by merely looking at the states of expression, whether they are quantitative or qualitative. There is no indication that “erect (1), erect to semi-erect (2), semi-erect (3)” is part of the 1 - 9 quantitative scale and especially if this asymmetry is also allowed for other similar cases it could become confusing (e.g. “strongly concave (1), concave (3), flat (5), convex (7), strongly convex (9)” or “much broader than long (1), broader than long (3), as long as broad (5), longer than broad (7), much longer than broad (9),” “much closer to base” etc.).

Proposal

It should be discussed whether all characteristics which cannot be presented symmetrically around a “medium” state or a fixed balancing point in the middle of a continuous linear scale, should rather be qualitative. If intermediate states are required they could be inserted in between.

Examples

- Ex.207: attitude: erect (1), semi-erect (3), horizontal (5), semi-deflexed (7), deflexed (9)
- Ex.208: attitude: erect (1), semi-erect (3), horizontal (5), semi-drooping (7), drooping (9)
- Ex.209: attitude: erect (1), semi-erect (3), intermediate (5), semi-prostrate (7), prostrate (9)

4. CHARACTERISTICS EXPRESSED QUANTITATIVELY

(a) Linear quantitative characteristics with a moderate or medium expression in the middle but with no fixed points

There are numerous examples and they seldom cause problems in the selection of the states of expression. States 1 and 9 are characterized by the prefix “very.” If “very” is not suitable - one cannot say “very closed” - the characteristic should belong under category 4b. (State one would then be reworded as “closed or very slightly open.”) Only a few examples have been listed.

Examples

- Ex.210: size: small (3), medium (5), large (7)
or Ex.211: very small (1), small (3), medium (5), large (7), very large (9)

- or Ex.212: 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)
- Ex.213: intensity of color: weak (3), medium (5), strong (7)
- Ex.214: width: narrow (3), medium (5), broad (7)
- Ex.215: ratio length / width: small (3), medium (5), large (7) (This is a combined characteristic.)
- Ex.216: blistering / bumpiness/ division / texture: fine (3), medium (5), coarse (7)
- Ex.217: compatibility: poor (3), medium (5), good (7)
- Ex.218: glossiness: dull (3), medium (5), glossy (7)
- Ex.219: uneven (3), medium (5), even (7)
- Ex.220: smooth (3), medium (5), rough (7)
- Ex.221: shape: narrow elliptic (3), elliptic (5), broad elliptic (7) (Should rather be: width: narrow (3), medium (5), broad (7).)
- Ex.222: acid (3), intermediate (5), sweet (7)

Limited range

In some cases the full scope of differences is so small that only a limited range of close states can be observed. These states should receive the Notes 4,5 and 6 as in the following examples, or 3,4,5,6,7 (no examples found):

- Ex.223: short to medium (4), medium (5), medium to long (6)
- Ex.224: thin to medium (4), medium (5), medium to thick (6)
- Ex.225: narrow to medium (4), medium (5), medium to broad (6)

- (b) Linear quantitative characteristics with a fixed point at one or sometimes both extreme ends of the scale but with no fixed balancing point in the middle

First presentation

- Ex.226: absent or very weak (1), weak (3), medium (5), strong (7), very strong (9)
There are numerous examples with state 1 as “absent or very” states 3 and 7 having the weak / strong word pair, and state 5 as “medium.” Only a few examples have been listed.

Second presentation

- Ex.227: alternative for Ex.226, only for cases where a clear (genetically based) absence exists: absent (1), present (9), followed by another characteristic: weak (3), medium (5), strong (7), in cases where it is required to clarify the different degrees of presence. (See discussion under 2(a.)

Examples

- Ex.228: curvature: absent or very weak (1), weak (3), medium (5), strong (7), very strong (9)
- Ex.229: difference; none or very slight (1), slight (3), medium (5), marked (7), very marked (7)
- Ex.230: overlapping: absent or very weak (1), weak (3), medium (5), strong (7), very strong (9)
- Ex.231: appearance: closed or very clustered (1), clustered (3), intermediate (5), open (7), very open (9)
- Ex.232: flat or slightly undulated (1), undulated (3), intermediate (5), folded (7), strongly folded (9)
- Ex.233: hollow or slightly semi-hollow (1), semi-hollow (3), intermediate (5), semi-solid (7), solid (9) (Theoretical example.)

Cases with weak /strong word pair lacking

Sometimes it happens that the weak /strong word pair that is so useful for states 3 and 7, is lacking. States 3 and 7 should then each be given a prefix to demonstrate the weak and strong expressions. State 5 should preferably have the prefix “moderately.” The part after “or” in state 1, as well as state 9, will have to have two prefixes each to demonstrate the extremes.

- Ex.234: curvature: straight or very slightly curved (1), slightly curved (3), moderately curved (5), strongly curved (7), very strongly curved (9)
- Ex.235: flat or very slightly convex (1), slightly convex (3), moderately convex (medium convex) (5), strongly convex (7), very strongly convex (9)

In the following example, state 1 has no “or very ...” and state 5 has no “.. moderately.” It should preferably be changed.

- Ex.236: shape in cross section: flat (1), weakly concave (3), concave (5), strongly concave (7), very strongly concave (9)

The wording for the even states becomes rather long but fortunately all states would normally not be mentioned in the Test Guidelines.

The full wording for example 235 would be: flat or very slightly convex (1), flat or very slightly convex to slightly convex (2), slightly convex (3), slightly (convex) to moderately convex (4), moderately convex (5), moderately (convex) to strongly convex (6), strongly convex (7), strongly (convex) to very strongly convex (8) very strongly convex (9)

In the two above examples, state 1 has only one basic word (straight, flat) but if it has two basic words the wording becomes more difficult and the “or very ---” has normally been left out:

Ex.237: same size (1), slightly smaller (3), moderately smaller (5), much smaller (7), very much smaller (9)

The full wording would be: same size (1), same size to slightly smaller (2), slightly smaller (3), slightly (smaller) to moderately smaller (4), moderately smaller (5), moderately (smaller) to much smaller (6), much smaller (7), much (smaller) to very much smaller (8), very much smaller (9)

Ex.238: in middle (1), slightly closer to base (3), moderately closer to base (5), much closer to base (7), very much closer to base (9)

The full wording would be: in middle (1), in middle to slightly closer to base (2), slightly closer to base (3), slightly (closer to base) to moderately closer to base (4), moderately closer to base (5), moderately (closer to base) to much closer to base (6), much closer to base (7), much (closer to base) to very much closer to base (8), very much closer to base (9)

Ex.239: same height (1), slightly above (3), moderately above (5), far above (7), very far above (9)

(c) Linear quantitative characteristics related to a fixed balancing point in the middle of the scale

Ex.240: far below (1), below (3), same height (5), above (7), far above (9)

Ex.241: much closer to base (1), closer to base (3), in middle (5), closer to apex (7), much closer to apex (9)

No examples were found where all 9 states of expressions have been listed in the Test Guidelines. Since the Editorial Committee requested that each state of expression should have a wording even if all states are not listed, the following full wording is recommended:

far below (1), far below to below (2), below (3), below to same height (4), same height (5), same height to above (6), above (7), above to far above (8), far above (9).

For characteristics with a longer basic wording the full wording would be rather complicated but since it is never really used it will not be of practical importance:

Much closer to base (1), much closer to base to closer to base (2), closer to base (3), slightly closer to base (4), in middle (5), slightly closer to apex (6), closer to apex (7), closer to apex to much closer to apex (8), much closer to apex (9)

In states 4 and 6 the wording has been shortened by using the word “slightly.” States 2 and 9 should rather not be shortened by avoiding the use of “to” and making states 1 and 9 “very much.” Only one of the practical examples has two prefixes for the extreme states. This one example should rather be amended. See example 253.

In some characteristics states 1 and 9 have no prefix, but states 3 and 7 each have the prefix "semi -...":

Ex.242: attitude: erect (1), semi-erect (3), horizontal (5), semi-drooping (7), drooping (9)

The wording of the following example is different:

Ex.243: position of maximum width: at blossom end (1), at a quarter from blossom end (3), at centre (5), at a quarter from stem end (7), at stem end (9)

The equal states will have to read: at one-eighth from blossom end (2), at three-eighths from blossom end (4), at three-eighths from stem end (6), at one-eighth from stem end (8)

Examples

- Ex.244: much smaller (1), smaller (3), same size (5), larger (7), much larger (9)
- Ex.245: deeply depressed (1), depressed (3), flat (5), pointed (7), strongly pointed (9)
- Ex.246: strongly concave (1), concave (3), flat (5), convex (7), strongly convex (9)
- Ex.247: angle: very acute (1), acute (3), approximately right angle (5), obtuse (7), very obtuse (9)
- Ex.248: concave (1), slightly concave (3), flat (5), slightly convex (7), convex (9)
(Should rather be reworded as Ex. 249)
- Ex.249: cupping: strongly concave (1), concave (3), plane (flat) (5), convex (7), strongly convex (9)
- Ex.250: curvature: strongly incurving (1), incurving (3), straight (5), reflexing (7), strongly reflexing (9)
- Ex.251: insertion: depressed (3), flat (5), raised (7)
- Ex.252: intensity: lighter (3), similar (5), darker (7)
- Ex.253: very much shorter (1), shorter (3), equal (5), longer (7), very much longer (9) (In states 1 and 9, "very" should rather be deleted.)
- Ex.254: near stalk (3), median (5), near eye (7)
- Ex.255: towards base (3), central (5), towards apex (7)
- Ex.256: position: beneath (3), level with (5), above (7)
- Ex.257: much broader than long (1), broader than long (3), as long as broad (5), longer than broad (7), much longer than broad (9)
- Ex.258: shape: strongly indented (1), indented (3), level (5), raised (7), strongly raised (9)
- Ex.259: narrow acute (1), acute (3), right angle (5), obtuse (7), broad obtuse (9)
- Ex.260: shape: strongly raised (1), raised (3), level (5), arched (7), strongly arched (9) (Is qualitative in TC/27/5.)
- Ex.261: size relative to: much smaller (1), smaller (3), same size (5), larger (7), much larger (9)

Limited range

In cases where full scope of differences is so small that only a limited range of close states can be observed, these states should receive the Notes 3,4,5,6,7 as in the following example (no examples found for states 4,5,6 - compare category 4a):

Ex.262: concave (3), flat concave (4), flat (5), flat convex (6), convex (7)

Ex.263: indented (3), indented to flat (4), flat (5), flat to pointed (6), pointed (7)

THE QUESTION WHETHER DISTINCTNESS IS RELATED TO THE STATES OF EXPRESSION

Some countries recognize distinctness between every second state in quantitative characteristics and between every state in qualitative characteristics. If this is UPOV policy, there could be a difference between the levels of distinctness if a characteristic was changed from quantitative to qualitative.

Example	<u>Quantitative characteristic</u>	<u>Qualitative characteristic</u>
erect	1	1
erect to semi-erect	2	2
semi-erect	3	3
semi-erect to horizontal	4	4
horizontal	5	5
etc.		
	In this case only 1,3 and 5 are regarded as distinct.	In this case 1,2,3,4 and 5 are all regarded as distinct.

This problem was raised by colleagues in the TWF.

[End of document]