



TG/153/3
ORIGINAL: English
DATE: 1996-10-18

INTERNATIONAL UNION
FOR THE PROTECTION
OF NEW VARIETIES OF
PLANTS

UNION INTERNATIONALE
POUR LA PROTECTION
DES OBTENTIONS
VÉGÉTALES

INTERNATIONALER
VERBAND ZUM SCHUTZ
VON PFLANZEN-
ZÜCHTUNGEN

UNIÓN INTERNACIONAL
PARA LA PROTECCIÓN
DE LAS OBTENCIONES
VEGETALES

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

GINGER
(Zingiber officinale Rosc.)

GENEVA
1996

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These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Zingiber officinale* Rosc.

II. Material Required

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

30 rhizomes.

The weight of the rhizome to be delivered should be 80 to 100g. The plant material supplied should be visibly healthy, not lacking in vigor or affected by any important pest or disease.

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

III. Conduct of Tests

1. The minimum duration of tests should be two similar growing periods with two consecutive plantings, the second being a replanting with the same plant material.

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

3. The tests should be carried out under conditions ensuring normal growth. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. As a minimum, each test should include 30 plants which should be divided between two or more replicates. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise indicated, all observations determined by measurement or counting should be made on 30 plants or parts of 30 plants.

2. For the assessment of uniformity a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 30 plants, the maximum number of off-types allowed would be 1.

3. Unless otherwise indicated, all observations on the plant, the leaf and the stem should be made before the end of the growing phase. Unless otherwise indicated, all observations on the stem should be made on the main stem (tallest) at the time of harvest.

4. All observations on the rhizome should be made at the time of harvesting.

V. Grouping of Varieties

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

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

- (a) Plant: height (characteristic 2)
- (b) Plant: number of stems (characteristic 3)
- (c) Stem: anthocyanin coloration (characteristic 12)
- (d) Rhizome: size of sections (characteristic 19).

VI. Characteristics and Symbols

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

2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of the different characteristics.

3. Legend:

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

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

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

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
|--|--|--|--|--|---------------|
| 1. Plant: growth habit | Plante: port | Pflanze: Wuchsform | Planta: porte | | |
| erect | dressé | aufrecht | erecto | Kintoki | 1 |
| semi-erect | demi-dressé | halbaufrecht | semierecto | Sanshû | 3 |
| spreading | étalé | breitwüchsig | rastrero | | 5 |
| 2. Plant: height (*) | Plante: hauteur | Pflanze: Höhe | Planta: altura | | |
| short | basse | niedrig | corta | Sanshû | 3 |
| medium | moyenne | mittel | media | Kintoki | 5 |
| tall | haute | hoch | alta | Indo | 7 |
| 3. Plant: number of stems (*) | Plante: nombre de tiges | Pflanze: Anzahl Triebe | Planta: número de tallos | | |
| few | petit | gering | bajo | Indo | 3 |
| medium | moyen | mittel | medio | Sanshû | 5 |
| many | grand | groß | alto | Kintoki | 7 |
| 4. Plant: attitude of top leaf (+) | Plante: port de la feuille la plus haute | Pflanze: Haltung des obersten Blattes | Planta: porte de la hoja más alta | | |
| erect | dressé | aufrecht | erecto | Yanaka | 1 |
| semi-erect | demi-dressé | halbaufrecht | semierecto | Sanshû | 3 |
| horizontal | horizontal | waagrecht | horizontal | Indo | 5 |
| 5. Plant: number of leaves on main stem | Plante: nombre de feuilles sur la tige principale | Pflanze: Anzahl Blätter am Haupttrieb | Planta: número de hojas en el tallo principal | | |
| few | petit | gering | bajo | Sanshû | 3 |
| medium | moyen | mittel | medio | Kintoki | 5 |
| many | grand | groß | alto | Indo | 7 |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
|--|--|--|---|--|---------------|
| 6. Leaf: length (upper third of stem) (*) | Feuille: longueur (tiers supérieur de la tige) | Blatt: Länge (oberes Drittel des Triebes) | Hoja: longitud (tercio superior del tallo) | | |
| short | courte | kurz | corto | Sanshû | 3 |
| medium | moyenne | mittel | medio | Yanaka | 5 |
| long | longue | lang | largo | Indo | 7 |
| 7. Leaf: width (as for 6) (*) | Feuille: largeur (comme pour 6) | Blatt: Breite (wie unter 6) | Hoja: anchura (como en 6) | | |
| narrow | étroite | schmal | estrecha | Sanshû | 3 |
| medium | moyenne | mittel | media | Yanaka | 5 |
| broad | large | breit | ancha | Indo | 7 |
| 8. Leaf: intensity of green color (as for 6) (*) | Feuille: intensité de la couleur verte (comme pour 6) | Blatt: Intensität der Grünfärbung (wie unter 6) | Hoja: intensidad del color verde (como en 6) | | |
| light | claire | hell | claro | Sanshû | 3 |
| medium | moyenne | mittel | medio | Yanaka | 5 |
| dark | foncée | dunkel | oscuro | Indo | 7 |
| 9. Stem: length (* (+) | Tige: longueur | Trieb: Länge | Tallo: longitud | | |
| short | courte | kurz | corto | Sanshû | 3 |
| medium | moyenne | mittel | medio | Kintoki | 5 |
| long | longue | lang | largo | Indo | 7 |
| 10. Stem: diameter (5cm from soil level) (* (+) | Tige: diamètre (5cm au-dessus du sol) | Trieb: Durchmesser (5 cm über dem Erdboden) | Tallo: diámetro (5cm sobre el suelo) | | |
| small | petit | klein | pequeño | Sanshû | 3 |
| medium | moyen | mittel | medio | Kintoki | 5 |
| large | grand | groß | grande | Indo | 7 |

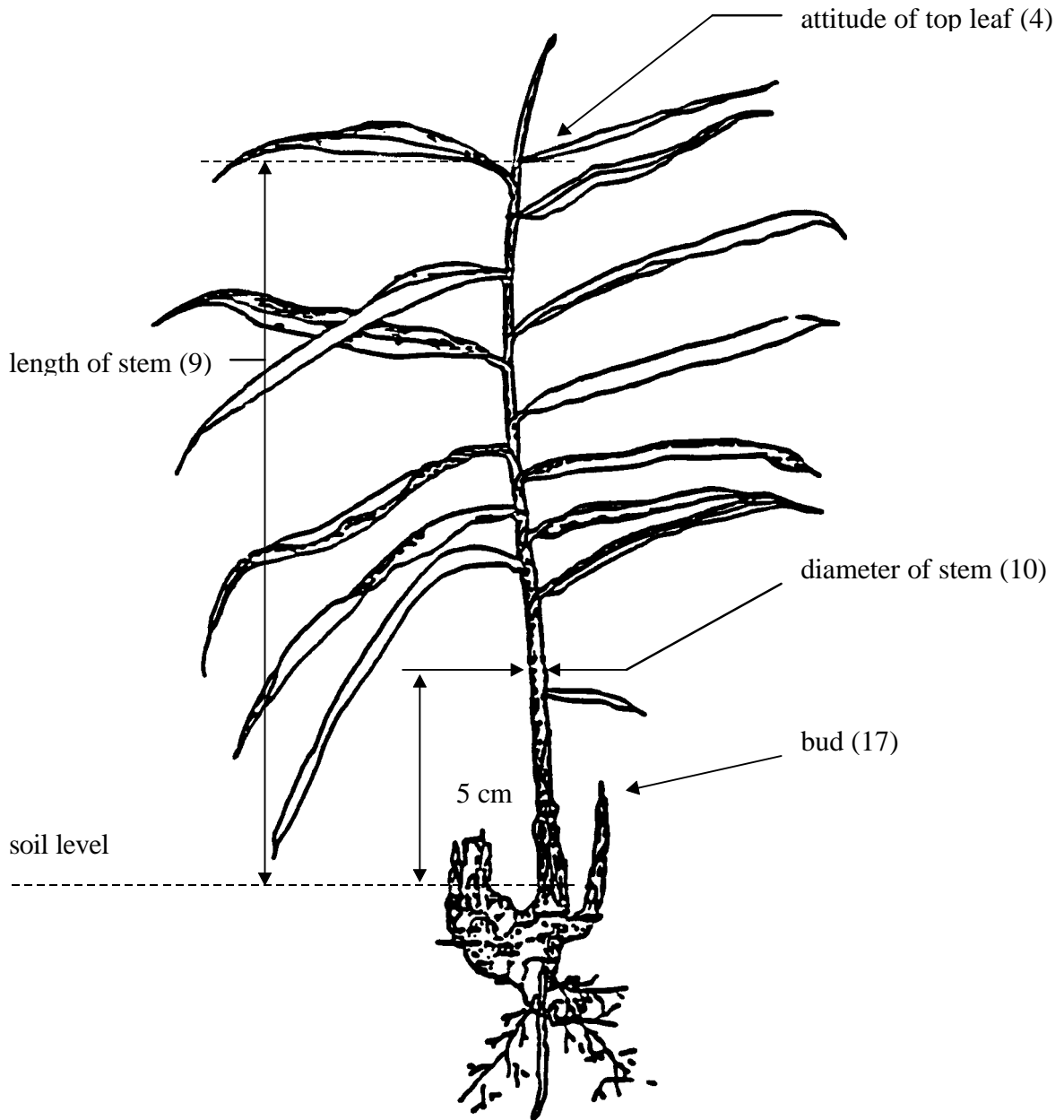
| English | français | deutsch | español | Example Varieties Exemples Beispielsorten Variedades ejemplo | Note/ Nota |
|---|--|--|--|---|---------------|
| 11. Stem: intensity of green color | Tige: intensité de la couleur verte | Trieb: Intensität der Grünfärbung | Tallo: intensidad del color verde | | |
| light | claire | hell | claro | Sanshû | 3 |
| medium | moyenne | mittel | medio | Yanaka | 5 |
| dark | foncée | dunkel | oscuro | Kintoki | 7 |
| 12. Stem: anthocyanin coloration (*) | Tige: pigmentation anthocyanique | Trieb: Anthocyanfärbung | Tallo: pigmentación antociánica | | |
| absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | | 1 |
| weak | faible | gering | débil | Sanshû | 3 |
| medium | moyenne | mittel | media | Yanaka | 5 |
| strong | forte | stark | fuerte | Kintoki | 7 |
| very strong | très forte | sehr stark | muy fuerte | | 9 |
| 13. Rhizome: total weight (*) | Rhizome: poids total | Rhizom: Gesamtgewicht | Rizoma: peso total | | |
| low | faible | gering | bajo | Kintoki | 3 |
| medium | moyen | mittel | medio | Rakuda | 5 |
| high | élevé | gross | alto | Indo | 7 |
| 14. Rhizome: shape (+) | Rhizome: forme | Rhizom: Form | Rizoma: forma | | |
| type-I | type-I | Typ I | tipo-I | Kintoki | 1 |
| type-II | type-II | Typ II | tipo-II | Rakuda | 2 |
| type-III | type-III | Typ III | tipo-III | Indo | 3 |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
|--|--|--|--|--|---------------|
| 15. Rhizome: skin color (*) | Rhizome: couleur de l'épiderme | Rhizom: Farbe der Haut | Rizoma: color de la piel | | |
| yellowish-white | blanc jaunâtre | gelblichweiß | blanco-amarillento | Sanshû | 1 |
| greyish yellow | jaune grisâtre | graugelb | amarillo-grisáceo | Indo | 2 |
| greenish yellow | jaune verdâtre | grünlichgelb | amarillo-verdoso | Yanaka | 3 |
| reddish yellow | jaune rougeâtre | rötlichgelb | amarillo-rojizo | Kintoki | 4 |
| 16. Rhizome: roughness of surface | Rhizome: rugosité de la surface | Rhizom: Rauheit der Oberfläche | Rizoma: rugosidad de la superficie | | |
| smooth | lisse | glatt | lisa | Indo | 3 |
| medium | moyenne | mittel | media | Rakunda | 5 |
| rough | rugueuse | rauh | rugosa | Sanshû | 7 |
| 17. Rhizome: anthocyanin coloration of bud (+) | Rhizome: pigmentation anthocyanique du bourgeon | Rhizom: Anthocyanfärbung der Knospe | Rizoma: pigmentación antociánica de la yema | | |
| absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | | 1 |
| weak | faible | gering | débil | Indo | 3 |
| medium | moyenne | mittel | media | Yanaka | 5 |
| strong | forte | stark | fuerte | Kintoki | 7 |
| very strong | très forte | sehr stark | muy fuerte | | 9 |
| 18. Rhizome: number of sections (* (+) | Rhizome: nombre de sections | Rhizom: Anzahl Abschnitte | Rizoma: número de secciones | | |
| few | petit | gering | bajo | Indo | 3 |
| medium | moyen | mittel | medio | Sanshû | 5 |
| many | grand | groß | alto | Kintoki | 7 |

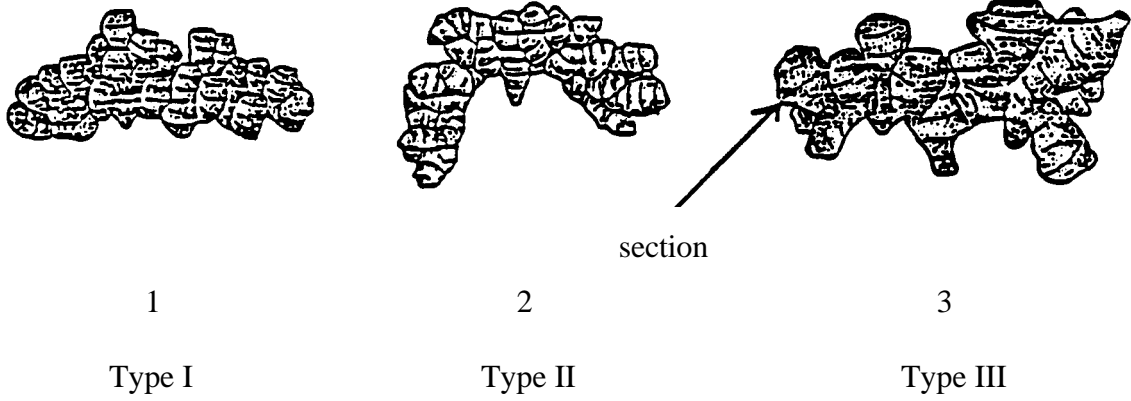
| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
|---|--|--|--|--|---------------|
| 19. Rhizome: size of sections (* (+) | Rhizome: taille des sections | Rhizom: Größe der Abschnitte | Rizoma: tamaño de las secciones | | |
| small | petites | klein | pequeñas | Kintoki | 3 |
| medium | moyennes | mittel | medias | Rakuda | 5 |
| large | grandes | groß | grandes | Indo | 7 |
| 20. Rhizome: color of flesh | Rhizome: couleur de la chair | Rhizom: Farbe des Fleisches | Rizoma: color de la carne | | |
| light yellowish grey | gris jaunâtre clair | hellgelblichgrau | gris amarillento claro | Indo | 1 |
| greyish yellow | jaune grisâtre | graugelb | amarillo grisáceo | Yanaka | 2 |
| yellow | jaune | gelb | amarillo | Sanshû | 3 |
| 21. Time of sprouting (after planting) | Époque de la levée (après plantation) | Zeitpunkt des Austriebs (nach dem Pflanzen) | Fecha de germinación (tras la plantación) | | |
| early | précoce | früh | temprana | Kintoki | 3 |
| medium | moyenne | mittel | media | Sanshû | 5 |
| late | tardive | spät | tardía | Indo | 7 |
| 22. Time of harvest maturity | Époque de maturité de récolte | Zeitpunkt der Erntereife | Fecha de madurez de la cosecha | | |
| early | précoce | früh | temprana | Kintoki | 3 |
| medium | moyenne | mittel | medio | Yanaka | 5 |
| late | tardive | spät | tardía | Indo | 7 |

VIII. Explanation on the Table of Characteristics

Ad. 4, 9, 10, 17: Characteristics on leaf (4), stem (9 & 10) and bud (17)



Ad. 14, 18, 19: Rhizome: shape (14), number and size of sections (18, 19)



Type I: Straight rhizome with high density of sections

Type II: Curved rhizome with medium density of sections

Type III: Zigzagged rhizome with low density of sections

IX. Literature

Aoki, H., 1988: "Ginger," Nogyogijutsu-taikei; Vegetable. Vol. 8, P. 1-200, Yôkendo, Tokio.

Ogawa, T., 1977: "Ginger," Yasaiengei-dai-jiten, P. 1060-1066, Yôkendo, Tokyo

X. Technical Questionnaire

| | |
|--|--|
| | Reference Number (not to be filled in by the applicant) |
| <p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p> | |
| 1. Species | <p><i>Zingiber officinale</i> Rosc. GINGER</p> |
| 2. Applicant (Name and address) | |
| 3. Proposed denomination or breeder's reference | |

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

4.1 Origin

(a) Seedling (indicate parent varieties)

..... []

(b) Mutation (indicate parent variety)

..... []

(c) Discovery (indicate where and when)

..... []

4.2 Other information

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

| Characteristics | Example Varieties | Note |
|--|-------------------|------|
| 5.1 Plant: height (2) | | |
| short | Sanshû | 3[] |
| medium | Kintoki | 5[] |
| tall | Indo | 7[] |
| 5.2 Plant: number of stems (3) | | |
| few | Indo | 3[] |
| medium | Sanshû | 5[] |
| many | Kintoki | 7[] |

| Characteristics | Example Varieties | Note | |
|---|--|--|--|
| 5.3 Stem: anthocyanin coloration (12) | | | |
| absent or very weak | | 1[] | |
| weak | Sanshû | 3[] | |
| medium | Yanaka | 5[] | |
| strong | Kintoki | 7[] | |
| very strong | | 9[] | |
| 5.4 Rhizome: size of sections (19) | | | |
| small | Kintoki | 3[] | |
| medium | Rakunda | 5[] | |
| large | Indo | 7[] | |
| 6. Similar varieties and differences between these varieties | | | |
| Denomination of similar variety | Characteristic in which the similar variety is different ^{o)} | State of expression of similar variety | State of expression of candidate variety |
| | | | |
| ^{o)} In the case of identical states of expressions of both varieties, please indicate the size of the difference. | | | |

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

7.2 Special conditions for the examination of the variety

7.3 Other information

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