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| International Union for the Protection of New Varieties of Plants |  |

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| Technical Working Party for Vegetables  Fifty-Ninth Session Virtual meeting, May 5 to 8, 2025 | TWV/59/7  Original: English  Date: March 31, 2025 |

Partial revision of the Test Guidelines for SHIITAKE

Document prepared by an expert from Japan

Disclaimer: this document does not represent UPOV policies or guidance

The purpose of this document is to present a proposal for a partial revision of the Test Guidelines for Shiitake (document TG/282/1 Rev.).

The Technical Working Party for Vegetables (TWV), at its fifty-eighth session[[1]](#footnote-2), agreed that the Test Guidelines for Shiitake (*Lentinula edodes* (Berk.) Pegler.) be partially revised (see document TWV/58/11 “Report”, Annex II).

The following changes are proposed:

1. Deletion of characteristics and explanation Ad. 4, 5, 6, 7, 8: “Mycelium: growth rate at 10°C, 15°C, 20°C, 25°C, 30°C”
2. Revision of characteristics 12 “Cap: height” and 20 “Gill: width” and explanation Ad. 10, 12, 20, 24, 25, 30
3. Revision of characteristic 31 “Fruit body: dry weight at harvest maturity” and deletion of explanation Ad. 31

The proposed changes are presented below in highlight and underline (insertion) and ~~strikethrough~~ (deletion).

Proposed deletion of characteristics and explanation Ad. 4, 5, 6, 7, 8: “Mycelium: growth rate at 10°C, 15°C, 20°C, 25°C, 30°C”

*Current wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **3.  (+)** | **MS** | **Mycelium: optimum temperature for growth** | **Mycélium : température optimale de culture** | **Myzel: optimale Wachstums-temperatur** | **Micelio: temperatura óptima de desarrollo** |  |  |
| **QN** | **(b)** | 23°C | 23°C | 23°C | 23°C | Kinko 243 | 3 |
|  |  | 25°C | 25°C | 25°C | 25°C | HS607, Kinko 115 | 5 |
|  |  | 27°C | 27°C | 27°C | 27°C | Morino Natsumi | 7 |
| **4.  (+)** | **MS** | **Mycelium: growth rate at 10°C** | **Mycélium : vitesse de croissance à 10°C** | **Myzel: Wachstumsrate bei 10°C** | **Micelio: índice de desarrollo a 10°C** |  |  |
| **QN** | **(b)** | very slow | très lente | sehr langsam | muy lento | Kinko 115 | 1 |
|  |  | slow | lente | langsam | lento | Kinoh1 | 2 |
|  |  | medium | moyenne | mittel | medio | HS607, Morino Natsumi | 3 |
|  |  | fast | rapide | schnell | rápido | KX-S005 | 4 |
|  |  | very fast | très rapide | sehr schnell | muy rápido | Yujiro | 5 |
| **5.  (+)** | **MS** | **Mycelium: growth rate at 15°C** | **Mycélium : vitesse de croissance à 15°C** | **Myzel: Wachstumsrate bei 15°C** | **Micelio: índice de desarrollo a 15°C** |  |  |
| **QN** | **(b)** | very slow | très lente | sehr langsam | muy lento |  | 1 |
|  |  | slow | lente | langsam | lento | Kinko 115 | 2 |
|  |  | medium | moyenne | mittel | medio | HS607, Susono 360 | 3 |
|  |  | fast | rapide | schnell | rápido | Yujiro | 4 |
|  |  | very fast | très rapide | sehr schnell | muy rápido | KX-S005 | 5 |
| **6. (\*) (+)** | **MS** | **Mycelium: growth rate** **at 20°C** | **Mycélium : vitesse de croissance à 20°C** | **Myzel: Wachstumsrate bei 20°C** | **Micelio: índice de desarrollo a 20°C** |  |  |
| **QN** | **(b)** | very slow | très lente | sehr langsam | muy lento | Bridge 32, Kinno 1 | 1 |
|  |  | slow | lente | langsam | lento | Kinko 115 | 2 |
|  |  | medium | moyenne | mittel | medio | ML8, Morino Natsumi | 3 |
|  |  | fast | rapide | schnell | rápido | Morino Harumitsu | 4 |
|  |  | very fast | très rapide | sehr schnell | muy rápido | Akiyama A-950,  Hokken 600, JMS 237 | 5 |
| **7.  (+)** | **MS** | **Mycelium: growth rate** **at 25°C** | **Mycélium : vitesse de croissance à 25°C** | **Myzel: Wachstumsrate bei 25°C** | **Micelio: índice de desarrollo a 25°C** |  |  |
| **QN** | **(b)** | very slow | très lente | sehr langsam | muy lento |  | 1 |
|  |  | slow | lente | langsam | lento | Kinko 115 | 2 |
|  |  | medium | moyenne | mittel | medio | HS73, Susono 360 | 3 |
|  |  | fast | rapide | schnell | rápido | Hokken600, Yujiro | 4 |
|  |  | very fast | très rapide | sehr schnell | muy rápido |  | 5 |
| **8. (\*) (+)** | **MS** | **Mycelium: growth rate** **at 30°C** | **Mycélium : vitesse de croissance à 30°C** | **Myzel: Wachstumsrate bei 30°C** | **Micelio: índice de desarrollo a 30°C** |  |  |
| **QN** | **(b)** | very slow | très lente | sehr langsam | muy lento | Akiyama A-526 | 1 |
|  |  | slow | lente | langsam | lento | HS73,  Morino Harumitsu | 2 |
|  |  | medium | moyenne | mittel | medio | Kinko 115 | 3 |
|  |  | fast | rapide | schnell | rápido | Mori XR1, Susono 360 | 4 |
|  |  | very fast | très rapide | sehr schnell | muy rápido | Morino Natsumi, Yujiro | 5 |

Ad. 3: Mycelium: optimum temperature for growth

Ad. 4, 5, 6, 7, 8: Mycelium: growth rate at 10°C, 15°C, 20°C, 25°C, 30°C

The incubation temperature of mycelium, which combines the information from characteristics 3 to 8, is examined at 10oC, 15oC, 20oC, 23oC, 25oC, 28oC and 30oC. Measure the length or diameter (see 8.1 (b) tube/plate) of mycelium between the 4th and the 14th day, cultured at each temperature. The amount of mycelium growth per day at each temperature is considered to be the growth rate. The optimum temperature for growth of mycelium is the incubation temperature which shows the highest growth rate. These characteristics should be evaluated by drawing a mycelium growth curve (see following graph).

|  |  |  |
| --- | --- | --- |
|  | A: diameter of  mycelium  B: length of colony |  |

*Proposed new wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **3.  (+)** | **MS** | **Mycelium: optimum temperature for growth** | **Mycélium : température optimale de culture** | **Myzel: optimale Wachstums-temperatur** | **Micelio: temperatura óptima de desarrollo** |  |  |
| **QN** | **(b)** | 23°C | 23°C | 23°C | 23°C | Kinko 243 | 3 |
|  |  | 25°C | 25°C | 25°C | 25°C | HS607, Kinko 115 | 5 |
|  |  | 27°C | 27°C | 27°C | 27°C | Morino Natsumi | 7 |
| **~~4.  (+)~~** | **~~MS~~** | **~~Mycelium: growth rate at 10°C~~** | **~~Mycélium : vitesse de croissance à 10°C~~** | **~~Myzel: Wachstumsrate bei 10°C~~** | **~~Micelio: índice de desarrollo a 10°C~~** |  |  |
| **~~QN~~** | **~~(b)~~** | ~~very slow~~ | ~~très lente~~ | ~~sehr langsam~~ | ~~muy lento~~ | ~~Kinko 115~~ | ~~1~~ |
|  |  | ~~slow~~ | ~~lente~~ | ~~langsam~~ | ~~lento~~ | ~~Kinoh1~~ | ~~2~~ |
|  |  | ~~medium~~ | ~~moyenne~~ | ~~mittel~~ | ~~medio~~ | ~~HS607, Morino Natsumi~~ | ~~3~~ |
|  |  | ~~fast~~ | ~~rapide~~ | ~~schnell~~ | ~~rápido~~ | ~~KX-S005~~ | ~~4~~ |
|  |  | ~~very fast~~ | ~~très rapide~~ | ~~sehr schnell~~ | ~~muy rápido~~ | ~~Yujiro~~ | ~~5~~ |
| **~~5.  (+)~~** | **~~MS~~** | **~~Mycelium: growth rate at 15°C~~** | **~~Mycélium : vitesse de croissance à 15°C~~** | **~~Myzel: Wachstumsrate bei 15°C~~** | **~~Micelio: índice de desarrollo a 15°C~~** |  |  |
| **~~QN~~** | **~~(b)~~** | ~~very slow~~ | ~~très lente~~ | ~~sehr langsam~~ | ~~muy lento~~ |  | ~~1~~ |
|  |  | ~~slow~~ | ~~lente~~ | ~~langsam~~ | ~~lento~~ | ~~Kinko 115~~ | ~~2~~ |
|  |  | ~~medium~~ | ~~moyenne~~ | ~~mittel~~ | ~~medio~~ | ~~HS607, Susono 360~~ | ~~3~~ |
|  |  | ~~fast~~ | ~~rapide~~ | ~~schnell~~ | ~~rápido~~ | ~~Yujiro~~ | ~~4~~ |
|  |  | ~~very fast~~ | ~~très rapide~~ | ~~sehr schnell~~ | ~~muy rápido~~ | ~~KX-S005~~ | ~~5~~ |
| **~~6. (\*) (+)~~** | **~~MS~~** | **~~Mycelium: growth rate~~****~~at 20°C~~** | **~~Mycélium : vitesse de croissance à 20°C~~** | **~~Myzel: Wachstumsrate bei 20°C~~** | **~~Micelio: índice de desarrollo a 20°C~~** |  |  |
| **~~QN~~** | **~~(b)~~** | ~~very slow~~ | ~~très lente~~ | ~~sehr langsam~~ | ~~muy lento~~ | ~~Bridge 32, Kinno 1~~ | ~~1~~ |
|  |  | ~~slow~~ | ~~lente~~ | ~~langsam~~ | ~~lento~~ | ~~Kinko 115~~ | ~~2~~ |
|  |  | ~~medium~~ | ~~moyenne~~ | ~~mittel~~ | ~~medio~~ | ~~ML8, Morino Natsumi~~ | ~~3~~ |
|  |  | ~~fast~~ | ~~rapide~~ | ~~schnell~~ | ~~rápido~~ | ~~Morino Harumitsu~~ | ~~4~~ |
|  |  | ~~very fast~~ | ~~très rapide~~ | ~~sehr schnell~~ | ~~muy rápido~~ | ~~Akiyama A-950,  Hokken 600, JMS 237~~ | ~~5~~ |
| **~~7.  (+)~~** | **~~MS~~** | **~~Mycelium: growth rate~~****~~at 25°C~~** | **~~Mycélium : vitesse de croissance à 25°C~~** | **~~Myzel: Wachstumsrate bei 25°C~~** | **~~Micelio: índice de desarrollo a 25°C~~** |  |  |
| **~~QN~~** | **~~(b)~~** | ~~very slow~~ | ~~très lente~~ | ~~sehr langsam~~ | ~~muy lento~~ |  | ~~1~~ |
|  |  | ~~slow~~ | ~~lente~~ | ~~langsam~~ | ~~lento~~ | ~~Kinko 115~~ | ~~2~~ |
|  |  | ~~medium~~ | ~~moyenne~~ | ~~mittel~~ | ~~medio~~ | ~~HS73, Susono 360~~ | ~~3~~ |
|  |  | ~~fast~~ | ~~rapide~~ | ~~schnell~~ | ~~rápido~~ | ~~Hokken600, Yujiro~~ | ~~4~~ |
|  |  | ~~very fast~~ | ~~très rapide~~ | ~~sehr schnell~~ | ~~muy rápido~~ |  | ~~5~~ |
| **~~8. (\*) (+)~~** | **~~MS~~** | **~~Mycelium: growth rate~~****~~at 30°C~~** | **~~Mycélium : vitesse de croissance à 30°C~~** | **~~Myzel: Wachstumsrate bei 30°C~~** | **~~Micelio: índice de desarrollo a 30°C~~** |  |  |
| **~~QN~~** | **~~(b)~~** | ~~very slow~~ | ~~très lente~~ | ~~sehr langsam~~ | ~~muy lento~~ | ~~Akiyama A-526~~ | ~~1~~ |
|  |  | ~~slow~~ | ~~lente~~ | ~~langsam~~ | ~~lento~~ | ~~HS73,  Morino Harumitsu~~ | ~~2~~ |
|  |  | ~~medium~~ | ~~moyenne~~ | ~~mittel~~ | ~~medio~~ | ~~Kinko 115~~ | ~~3~~ |
|  |  | ~~fast~~ | ~~rapide~~ | ~~schnell~~ | ~~rápido~~ | ~~Mori XR1, Susono 360~~ | ~~4~~ |
|  |  | ~~very fast~~ | ~~très rapide~~ | ~~sehr schnell~~ | ~~muy rápido~~ | ~~Morino Natsumi, Yujiro~~ | ~~5~~ |

Ad. 3: Mycelium: optimum temperature for growth

~~Ad. 4, 5, 6, 7, 8: Mycelium: growth rate at 10°C, 15°C, 20°C, 25°C, 30°C~~

The incubation temperature of mycelium, ~~which combines the information from characteristics 3 to 8,~~ is examined at ~~10~~~~o~~~~C, 15~~~~o~~~~C,~~ 20oC, 23oC, 25oC, 27~~28~~oC and 30oC. Measure the length or diameter (see 8.1 (b) tube/plate) of mycelium between the 4th and the 14th day, cultured at each temperature. The amount of mycelium growth per day at each temperature is considered to be the growth rate. The optimum temperature for growth of mycelium is the incubation temperature which shows the highest growth rate. These characteristics should be evaluated by drawing a mycelium growth curve (see following graph).

|  |  |  |
| --- | --- | --- |
|  | A: diameter of  mycelium  B: length of colony |  |

Proposed revision of characteristics 12 “Cap: height” and 20 “Gill: width” and explanation Ad. 10, 12, 20, 24, 25, 30

*Current wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **12  (+)** | **VG/ MS** | **Cap: height** | **Chapeau : hauteur** | **Hut: Höhe** | **Sombrero: altura** |  |  |
| **QN** | **(c)** | low | basse | niedrig | bajo | Morino Harumitsu | 3 |
|  |  | medium | moyenne | mittel | medio | Mori XR1,  Morino Natsumi,  Susono 360 | 5 |
|  |  | high | haute | hoch | alto | Akiyama A-526 | 7 |
| **20  (+)** | **VG** | **Gill: width** | **Lamelles : largeur** | **Lamellen: Breite** | **Láminas: anchura** |  |  |
| **QN** | **(c)** | very narrow | très étroites | sehr schmal | muy estrecha | Mori XR1 | 1 |
|  |  | narrow | étroites | schmal | estrecha | Yujiro | 3 |
|  |  | medium | moyennes | mittel | media | Susono 360 | 5 |
|  |  | wide | larges | breit | ancha | KX-S034 | 7 |
|  |  | very wide | très larges | sehr breit | muy ancha |  | 9 |

Ad. 10: Cap: diameter

Ad. 12: Cap: height

Ad. 20: Gill: width

Ad. 24: Stipe: length

Ad. 25: Stipe: diameter

Ad. 30: Fruit body: ratio of cap diameter / stipe length



1: Cap: diameter: Measure the widest part of the cap.

2: Cap: height: Measure the highest part of the cap.

3: Gill: width: Measure the widest part of the gill.

4: Stipe: length: Measure from the base of the stipe to the base of cap.

5: Stipe: diameter: Measure the widest part of the stipe.

*Proposed new wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **12  (+)** | **VG/ MS** | **Cap: thickness ~~height~~** |  |  |  |  |  |
| **QN** | **(c)** | thin ~~low~~ |  |  |  | Morino Harumitsu | 3 |
|  |  | medium |  |  |  | Mori XR1,  Morino Natsumi,  Susono 360 | 5 |
|  |  | thick ~~high~~ |  |  |  | Akiyama A-526 | 7 |
| **20  (+)** | **VG** | **Gill: height ~~width~~** |  |  |  |  |  |
| **QN** | **(c)** | very low ~~narrow~~ |  |  |  | Mori XR1 | 1 |
|  |  | low ~~narrow~~ |  |  |  | Yujiro | 2 ~~3~~ |
|  |  | medium |  |  |  | Susono 360 | 3 ~~5~~ |
|  |  | high ~~wide~~ |  |  |  | KX-S034 | 4 ~~7~~ |
|  |  | very high ~~wide~~ |  |  |  |  | 5 ~~9~~ |

Ad. 10: Cap: diameter

Ad. 12: Cap: thickness ~~height~~

Ad. 20: Gill: height ~~width~~

Ad. 24: Stipe: length

Ad. 25: Stipe: diameter

Ad. 30: Fruit body: ratio of cap diameter / stipe length



1: Cap: diameter: Measure the widest part of the cap.

2: Cap: thickness ~~height~~: Measure the thickest ~~highest~~ part of the cap.

3: Gill: height ~~width~~: Measure the highest ~~widest~~ part of the gill.

4: Stipe: length: Measure from the base of the stipe to the base of cap.

5: Stipe: diameter: Measure the widest part of the stipe.

Proposed revision of characteristic 31 “Fruit body: dry weight at harvest maturity” and deletion of explanation Ad. 31

*Current wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **31  (+)** | **MG** | **Fruit body: dry weight at harvest maturity** |  |  |  |  |  |
| **QN** | **(c)** | light |  |  |  | HS73 | 3 |
|  |  | medium |  |  |  | Akiyama A-526, Susono 360, Yujiro | 5 |
|  |  | heavy |  |  |  |  | 7 |

Ad. 31: Fruit body: dry weight at harvest maturity

The fruit body should be dried at 60 °C until a constant weight.

*Proposed new wording*

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **31  ~~(+)~~** | **MG** | **Fruit body: fresh ~~dry~~ weight at harvest maturity** | **Organe de fructification : poids sec à maturité de récolte** | **Fruchtkörper: Trockengewicht bei Erntereife** | **Cuerpo frutal: peso seco en la época de madurez para la cosecha** |  |  |
| **QN** | **(c)** | light | petit | leicht | ligero | HS73 | 3 |
|  |  | medium | moyen | mittel | medio | Akiyama A-526, Susono 360, Yujiro | 5 |
|  |  | heavy | élevé | schwer | pesado |  | 7 |

~~Ad. 31: Fruit body: dry weight at harvest maturity~~

~~The fruit body should be dried at 60 °C until a constant weight.~~

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1. held via electronic means, from April 22 to 25, 2024. [↑](#footnote-ref-2)