[PleaseReview document review. Review title: 2025 First consultation: 2023-028 - Draft annex International movement of fresh Musa spp. fruit to ISPM 46 . Document title: 2023-028\_DraftAnnex\_ISPM46\_IntMovBanana\_eng.docx]

***[1]*****DRAFT ANNEX TO ISPM 46: International movement of fresh *Musa* spp*.* fruit (2023-028)**

***[2]*Status box**

|  |
| --- |
| ***[3]***This is not an official part of the standard and it will be modified by the IPPC Secretariat after adoption. |
| ***[4]*Date of this document** | ***[5]***2025-05-23 |
| ***[6]*Document category** | ***[7]***Draft annex to ISPM 46 |
| ***[8]*Current document stage** | ***[9]****To* first consultation |
| ***[10]*Major stages** | ***[11]***2024-04 CPM-18 added topic Annex *International movement of fresh banana* (Musa paradisiaca) *fruit* (2023-028) to ISPM 46 (*Commodity-specific standards for phytosanitary measures*) to the work programme, priority 1.***[12]***2024-12 Technical Panel on Commodity Standards (TPCS) drafted.***[13]***2024-12 Standards Committee (SC) agreed change of title to *International movement of fresh* Musa *spp.* *fruit* (2025\_eSC\_May\_03).***[14]***2025-01 to 2025-02 TPCS revised and recommended to SC for approval for consultation.***[15]***2025-05 SC revised and approved for first consultation. |
| ***[16]*Steward history** | ***[17]***2024-05 SC André Felipe C.P. da SILVA (BR, Steward)***[18]***2024-12 TPCS Donam KIM (KR, Assistant Steward) ***[19]***2024-12 TPCS Sun SHUANGYAN (CN, Assistant Steward)  |
| ***[20]*Notes** | ***[21]***2025-03 Edited***[22]***2025-05 Edited |

***[23]***Adoption

***[24]***[Text to this paragraph will be added following adoption.]

***[25]***1. Scope

***[26]***This commodity standard provides guidance for national plant protection organizations (NPPOs) on pests associated with the fresh fruit of *Musa* spp. (Zingiberales: Musaceae) and options for phytosanitary measures for the international movement of fresh *Musa* spp. fruit.

***[27]***2. Description of the commodity and its intended use

***[28]***This commodity standard applies to the fresh fruit of *Musa* spp*.* (e.g. in hands or in clusters). It does not apply to bunches (see figures in Appendix 1), because they are not traded internationally. It applies to fruit that has been produced for international trade and is intended for consumption or processing in an importing country. It does not apply to fruit that has already been processed (e.g. canned, chopped, dried, frozen, mashed).

***[29]***3. Pests associated with fresh *Musa* spp. fruit

***[30]***The pests included in Table 1 are considered to be associated with fresh *Musa* spp. fruit and are regulated in international trade by at least one contracting party based on technical justification. The list of pests is not exhaustive, nor country specific.

***[31]***The list of pests does not consider factors that may influence pest infestation of fruit in the country of origin (e.g. cultivar or variety, geographical and ecological factors, agricultural and production practices).

***[32]***Inclusion of a pest in Table 1 does not constitute technical justification for its regulation by importing countries using this standard. When determining whether to regulate a pest listed in this commodity standard, the NPPO of the importing country should base its decision on technical justification using either a pest risk analysis or, where applicable, another comparable examination and evaluation of available scientific information.

***[33]*Table 1.** Pests considered to be associated with fresh *Musa* spp. fruit\*

| ***[34]*Pest group** | ***[35]*Family** | ***[36]*Species (scientific name and authority)†** |
| --- | --- | --- |
| ***[37]*Arthropoda: Arachnida** | ***[38]*** | ***[39]*** |
| ***[40]***Mites (Trombidiformes) | ***[41]***Tenuipalpidae | ***[42]****Raoiella indica* Hirst, 1924 |
| ***[44]***Tetranychidae | ***[45]****Oligonychus orthius* Rimando, 1962 |
| ***[48]****Oligonychus velascoi* Rimando, 1962 |
| ***[51]***Tetranychus piercei McGregor, 1950 |
| ***[52]*Arthropoda: Insecta** | ***[53]*** | ***[54]*** |
| ***[55]***Fruit flies (Diptera) | ***[56]***Tephritidae | ***[57]****Bactrocera bryoniae* (Tryon, 1927) |
| ***[60]****Bactrocera carambolae* Drew & Hancock, 1994 |
| ***[63]****Bactrocera caryeae* (Kapoor, 1971) |
| ***[66]****Bactrocera cucumis* (French, 1907) |
| ***[69]****Bactrocera dorsalis* (Hendel, 1912) |
| ***[72]****Bactrocera facialis* (Coquillett, 1909) |
| ***[75]****Bactrocera frauenfeldi* (Schiner, 1868) |
| ***[78]****Bactrocera jarvisi* (Tryon, 1927) |
| ***[81]****Bactrocera kandiensis* Drew & Hancock, 1994 |
| ***[84]****Bactrocera kirki* (Froggatt, 1911) |
| ***[87]****Bactrocera kraussi* (Hardy, 1951) |
| ***[90]****Bactrocera musae* (Tryon, 1927) |
| ***[93]****Bactrocera neohumeralis* (Hardy, 1951) |
| ***[96]****Bactrocera occipitalis* (Bezzi, 1919) |
| ***[99]****Bactrocera pyrifoliae* Drew & Hancock, 1994 |
| ***[102]****Bactrocera tryoni* (Froggatt, 1897) |
| ***[105]****Ceratitis capitata* (Wiedemann, 1824) |
| ***[108]****Ceratitis cosyra* (Walker, 1849) |
| ***[111]****Zeugodacus tau* (Walker, 1849)  |
| ***[112]***Aphids (Hemiptera) | ***[113]***Aphididae | ***[114]****Pentalonia nigronervosa* Coquerel, 1859  |
| ***[115]***Mealybugs and scales (Hemiptera) | ***[116]***Diaspididae | ***[117]****Aspidiotus coryphae* Cockerell & Robinson, 1915 |
| ***[120]****Aspidiotus destructor* Signoret, 1869 |
| ***[123]****Aspidiotus excisus* Green, 1896 |
| ***[126]****Hemiberlesia cyanophylli* (Signoret, 1869) |
| ***[129]****Hemiberlesia lataniae* (Signoret, 1869) |
| ***[132]****Hemiberlesia palmae* (Cockerell, 1893) |
| ***[135]****Pinnaspis musae* Takagi, 1963 |
| ***[138]****Selenaspidus articulatus* (Morgan, 1889) |
| ***[139]*** | ***[140]***Pseudococcidae | ***[141]****Dysmicoccus bispinosus* Beardsley, 1965  |
| ***[144]****Dysmicoccus brevipes* (Cockerell, 1893) |
| ***[147]****Dysmicoccus grassii* (Leonardi, 1913) |
| ***[150]****Dysmicoccus neobrevipes* Beardsley, 1959 |
| ***[153]****Ferrisia virgata* (Cockerell, 1893) |
| ***[156]****Maconellicoccus hirsutus* (Green, 1908) |
| ***[159]****Nipaecoccus nipae* (Maskell, 1893) |
| ***[162]****Planococcus lilacinus* (Cockerell, 1905) |
| ***[165]****Planococcus minor* (Maskell, 1897) |
| ***[168]****Pseudococcus comstocki* (Kuwana, 1902) |
| ***[171]****Pseudococcus elisae* Borchsenius, 1947 |
| ***[174]****Pseudococcus jackbeardsleyi* Gimpel & Miller, 1996 |
| ***[175]***Whiteflies (Hemiptera) | ***[176]***Aleyrodidae | ***[177]****Aleurocanthus woglumi* Ashby, 1915 |
| ***[180]****Aleurodicus dispersus* Russell, 1965 |
| ***[183]****Aleurodicus floccissimus* (Martin, Hérnandez-Suarez & Carnero, 1997) |
| ***[184]***Moths (Lepidoptera) | ***[185]***Crambidae | ***[186]****Nacoleia octasema* (Meyrick, 1886) |
| ***[188]***Noctuidae | ***[189]****Spodoptera eridania* (Stoll, 1782) |
| ***[192]****Spodoptera frugiperda* (Smith, 1797) |
| ***[194]***Nymphalidae | ***[195]****Opsiphanes tamarindi* Felder, 1861 |
| ***[197]***Psychidae | ***[198]***Oiketicus kirbyi Guilding, 1827 |
| ***[200]***Tineidae | ***[201]****Opogona sacchari* (Bojer, 1856) |
| ***[202]***Thrips (Thysanoptera) | ***[203]***Thripidae | ***[204]****Chaetanaphothrips signipennis* (Bagnall, 1914) |
| ***[207]****Elixothrips brevisetis* (Bagnall, 1919) |
| ***[210]****Frankliniella parvula* Hood, 1925 |
| ***[213]****Hercinothrips bicinctus* (Bagnall, 1919) |
| ***[216]****Palleucothrips musae* (Hood, 1956) |
| ***[219]****Thrips hawaiiensis* (Morgan, 1913) |
| ***[222]****Thrips palmi* Karny, 1925 |
| ***[223]*Mollusca** | ***[224]*** | ***[225]*** |
| ***[226]***Snails (Gastropoda) | ***[227]***Achatinidae | ***[228]****Lissachatina fulica* (Bowdich, 1822) |
| ***[229]*** | ***[230]***Succineidae | ***[231]****Succinea* spp. Draparnaud, 1801 |
| ***[232]*Fungi** | ***[233]*** | ***[234]*** |
| ***[235]***Fungi | ***[236]***Ceratocystidaceae | ***[237]****Ceratocystis paradoxa* (Dade) C. Moreau, 1952 |
| ***[239]***Glomerellaceae | ***[240]****Colletotrichum musae* (Berk. & M.A. Curtis) Arx, 1957 |
| ***[242]***Mycosphaerellaceae | ***[243]****Mycosphaerella musicola* R. Leach, 1941 |
| ***[246]****Pseudocercospora fijiensis* (M. Morelet) Deighton, 1976 |
| ***[248]***Nectriaceae | ***[249]****Fusarium oxysporum* f.sp. *cubense* (E.F. Sm.) W.C. Snyder & H.N. Hansen, 1940, Tropical Race 4 |
| ***[251]***Phyllostictaceae | ***[252]****Phyllosticta cavendishii* M.H. Wong & Crous, 2012 |
| ***[253]*Bacteria** | ***[254]*** | ***[255]*** |
| ***[256]***Bacteria | ***[257]***Burkholderiaceae | ***[258]***Races and strains of *Ralstonia solanacearum* (Smith 1896) Yabuuchi *et al.* 1996 emend. Safni *et al.* 2014 that affect *Musa* spp. |

***[259]****Notes: \** Information used to compile this list was supplied by at least one contracting party and may be provided by the IPPC Secretariat upon request.

***[260]***† Scientific names used in this table are based on the submissions by contracting parties, modified where more than one name was submitted to the more recent scientific name or aligned with ISPM 27 (*Diagnostic protocols for regulated pests*) or ISPM 28 (*Phytosanitary treatments for regulated pests*).

***[261]***4. Options for phytosanitary measures

***[262]***This section provides options for phytosanitary measures that may be relevant for the pests listed in Table 1. The options presented are not exhaustive and contracting parties may consider other options.

***[263]***Table 2 provides general options for phytosanitary measures that may be relevant to pests listed in Table 1.

***[264]***Table 3 lists some pest-specific options to manage the pest risk of pests listed in Table 1, with further details in Table 4 and Table 5. Abbreviations used for options for phytosanitary measures are listed in Box 1, as well as below in relevant tables.

***[265]***Importing-country NPPOs should decide whether the options listed in Table 3 are effective at managing the pest risk to an acceptable level before selecting them as phytosanitary measures. Importing-country NPPOs should also consider whether a measure for one pest will effectively manage the pest risk of other regulated pests of *Musa* spp. fruit. In addition, when applying these options as phytosanitary measures, NPPOs should consider the procedures for successful application.

***[266]***Options for phytosanitary measures included in this commodity standard may be effective at managing pest risk when used alone or when integrated with other measures in a systems approach as described in ISPM 14 (*The use of integrated measures in a systems approach for pest risk management*).

***[267]***Phytosanitary treatments (PTs) that have been adopted by the Commission on Phytosanitary Measures as annexes to ISPM 28 (*Phytosanitary treatments for regulated pests*) are shown in bold in Table 3 and Table 4.

***[268]*Table 2.** General options for phytosanitary measures

|  |  |
| --- | --- |
| ***[269]*Options for phytosanitary measures** | ***[270]*References** |
| ***[271]***Pest free areas | ***[272]***ISPM 4 (*Requirements for the establishment of pest free areas*)***[273]***ISPM 26 (*Establishment of pest free areas for fruit flies (Tephritidae)*) |
| ***[274]***Pest free places of production and pest free production sites | ***[275]***ISPM 10 (*Requirements for the establishment of pest free places of production and pest free production sites*) |
| ***[276]***Areas of low pest prevalence | ***[277]***ISPM 22 (*Requirements for the establishment of areas of low pest prevalence*) |
| ***[278]***Systems approaches | ***[279]***ISPM 14 (*The use of integrated measures in a systems approach for pest risk management*)***[280]***ISPM 35 (*Systems approach for pest risk management of fruit flies (Tephritidae)*) |
| ***[281]***Specific physiological stage of maturity at harvest (e.g. hard green, mature green) | ***[282]***ISPM 11 (*Pest risk analysis for quarantine pests*)***[283]***ISPM 37 (*Determination of host status of fruit to fruit flies (Tephritidae)*) |
| ***[284]***Phytosanitary treatments | ***[285]***ISPM 28 (Phytosanitary treatments for regulated pests) |
| ***[286]***Inspection | ***[287]***ISPM 23 (*Guidelines for inspection*)***[288]***ISPM 31 (*Methodologies for sampling of consignments*) |
| ***[289]***Testing and pest identification  | ***[290]***ISPM 27 (*Diagnostic protocols for regulated pests*) |
| ***[291]***Phytosanitary certification | ***[292]***ISPM 7 (*Phytosanitary certification system*)***[293]***ISPM 12 (*Phytosanitary certificates*) |

***[294]****Sources:* See section 5.1.

***[295]*Box 1.** Abbreviations used in this commodity standard for options for phytosanitary measures

|  |  |
| --- | --- |
| ***[296]***IRDN | ***[297]***Irradiation |
| ***[298]***PFA | ***[299]***pest free area |
| ***[300]***PFPP | ***[301]***pest free place of production |
| ***[302]***SA | ***[303]***systems approach |

***[304]*Table 3.** Pest-specific options for phytosanitary measures

| ***[305]*****Pest species** | ***[306]*Options for phytosanitary measures** |
| --- | --- |
| ***[307]*Mites**  | ***[308]*** |
| ***[309]****Oligonychus orthius* | ***[310]***Export inspection\* |
| ***[311]****Oligonychus velascoi* | ***[312]***Export inspection\* |
| ***[313]****Raoiella indica* | ***[314]***Export inspection\* |
| ***[315]****Tetranychus piercei* | ***[316]***Export inspection\* |
| ***[317]*Fruit flies**  | ***[318]*** |
| ***[319]****Bactrocera bryoniae* | ***[320]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[321]****Bactrocera carambolae* | ***[322]***Export inspection;\* **IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[323]****Bactrocera caryeae* | ***[324]***Export inspection;\* **IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[325]****Bactrocera cucumis* | ***[326]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[327]****Bactrocera dorsalis*  | ***[328]***Export inspection;\* **IRDN 3**, **4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[329]****Bactrocera facialis* | ***[330]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[331]****Bactrocera frauenfeldi* | ***[332]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[333]****Bactrocera jarvisi* | ***[334]*IRDN 2**, **4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[335]****Bactrocera kandiensis* | ***[336]***Export inspection;\* **IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[337]****Bactrocera kirki* | ***[338]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[339]****Bactrocera kraussi* | ***[340]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[341]****Bactrocera musae* | ***[342]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest  |
| ***[343]****Bactrocera neohumeralis* | ***[344]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[345]****Bactrocera occipitalis* | ***[346]***Export inspection;\* **IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[347]****Bactrocera pyrifoliae* | ***[348]***Export inspection;\* **IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[349]****Bactrocera tryoni*  | ***[350]***Export inspection;\* **IRDN 2**, **4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[351]****Ceratitis capitata* | ***[352]*IRDN 2**, **4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[353]****Ceratitis cosyra* | ***[354]*IRDN 4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[355]****Zeugodacus tau* | ***[356]*IRDN 1**, **4**; PFA; SA 1; specific physiological stage of maturity at harvest |
| ***[357]*Aphids**  | ***[358]*** |
| ***[359]****Pentalonia nigronervosa* | ***[360]***Field and export inspection† |
| ***[361]*Mealybugs and scales**  | ***[362]*** |
| ***[363]****Aspidiotus coryphae* | ***[364]***Export inspection\* |
| ***[365]****Aspidiotus destructor* | ***[366]***SA 3 |
| ***[367]****Aspidiotus excisus*  | ***[368]***Export inspection;\* SA 3 |
| ***[369]****Dysmicoccus bispinosus* | ***[370]***Field and export inspection† |
| ***[371]****Dysmicoccus brevipes* | ***[372]***Export inspection;\* SA 3 |
| ***[373]****Dysmicoccus grassii* | ***[374]***SA 3 |
| ***[375]****Dysmicoccus neobrevipes* | ***[376]***Export inspection;\* **IRDN 6**; SA 3 |
| ***[377]****Ferrisia virgata* | ***[378]***Export inspection\*  |
| ***[379]****Hemiberlesia cyanophylli* | ***[380]***Export inspection\* |
| ***[381]****Hemiberlesia lataniae* | ***[382]***SA 3 |
| ***[383]****Hemiberlesia palmae* | ***[384]***Export inspection\* |
| ***[385]****Maconellicoccus hirsutus* | ***[386]***Export inspection;\* PFA |
| ***[387]****Nipaecoccus nipae* | ***[388]***Export inspection\*  |
| ***[389]****Pinnaspis musae* | ***[390]***Export inspection\* |
| ***[391]****Planococcus lilacinus* | ***[392]*IRDN 6**; SA 3 |
| ***[393]****Planococcus minor* | ***[394]***Export inspection;\* **IRDN 6**;SA 3 |
| ***[395]****Pseudococcus comstocki* | ***[396]***Export inspection\* |
| ***[397]****Pseudococcus elisae* | ***[398]***Export inspection\* |
| ***[399]****Pseudococcus jackbeardsleyi* | ***[400]***Export inspection;\* **IRDN 5**; SA 3 |
| ***[401]****Selenaspidus articulatus* | ***[402]***Export inspection\* |
| ***[403]*Whiteflies** | ***[404]*** |
| ***[405]****Aleurocanthus woglumi* | ***[406]***PFA  |
| ***[407]****Aleurodicus dispersus* | ***[408]***Field and export inspection† |
| ***[409]****Aleurodicus floccissimus* | ***[410]***Export inspection\* |
| ***[411]*Moths** | ***[412]*** |
| ***[413]****Nacoleia octasema* | ***[414]***Export inspection\* |
| ***[415]****Oiketicus kirbyi*  | ***[416]***Field and export inspection† |
| ***[417]****Opogona sacchari* | ***[418]***Export inspection\* |
| ***[419]****Opsiphanes tamarindi*  | ***[420]***Field and export inspection† |
| ***[421]****Spodoptera eridania*  | ***[422]***Field and export inspection† |
| ***[423]****Spodoptera frugiperda*  | ***[424]***Field and export inspection† |
| ***[425]*Thrips** | ***[426]*** |
| ***[427]****Chaetanaphothrips signipennis* | ***[428]***Export inspection\* |
| ***[429]****Elixothrips brevisetis* | ***[430]***Export inspection\* |
| ***[431]****Frankliniella parvula* | ***[432]***Export inspection\* |
| ***[433]****Hercinothrips bicinctus* | ***[434]***Export inspection\* |
| ***[435]****Palleucothrips musae* | ***[436]***Export inspection\* |
| ***[437]****Thrips hawaiiensis* | ***[438]***Export inspection\* |
| ***[439]****Thrips palmi* | ***[440]***Export inspection\* |
| ***[441]*Snails** | ***[442]*** |
| ***[443]****Lissachatina fulica*  | ***[444]***Export inspection\* |
| ***[445]****Succinea* spp. | ***[446]***Export inspection\*  |
| ***[447]*Fungi**  | ***[448]*** |
| ***[449]****Ceratocystis paradoxa* | ***[450]***Field and export inspection† |
| ***[451]****Colletotrichum musae* | ***[452]***Field and export inspection† |
| ***[453]****Fusarium oxysporum* f.sp. *cubense* TR4 | ***[454]***PFA; PFPP |
| ***[455]****Pseudocercospora fijiensis* | ***[456]***PFA; SA 3 |
| ***[457]****Mycosphaerella musicola* | ***[458]***SA 3 |
| ***[459]****Phyllosticta cavendishii* | ***[460]***SA 3 |
| ***[461]*Bacteria**  | ***[462]*** |
| ***[463]***Races and strains of *Ralstonia solanacearum* that affect *Musa* spp. | ***[464]***PFPP; SA 2 |

***[465]****Notes:* Options in bold are **PTs** (phytosanitary treatments adopted as annexes toISPM 28 (*Phytosanitary treatments for regulated pests*)): PTs are adopted by the Commission on Phytosanitary Measures (CPM); other treatments included in the table meet the criteria in ISPM 46 (*Commodity-specific standards for phytosanitary measures*) but are not adopted by the CPM.

***[466]***\* Export inspection targeting the pest of concern and the application of a remedial action if the pest is detected.

***[467]***† Field and export inspection targeting the pest of concern and the application of a corrective or remedial action if the pest is detected.

***[468]***IRDN, irradiation (see Table 4); PFA, pest free area; PFPP, pest free place of production; SA, systems approach (see Table 5); TR4, Tropical Race 4.

***[469]*Table 4.** Options for irradiation (IRDN)

|  |  |  |
| --- | --- | --- |
| ***[470]*Measure number** | ***[471]*Minimum absorbed dose (Gy)** | ***[472]*References** |
| ***[473]*IRDN 1** | ***[474]*72 or 85** | ***[475]*PT 42 (Irradiation treatment for *Zeugodacus tau*)** |
| ***[476]*IRDN 2** | ***[477]*100** | ***[478]*PT 4 (Irradiation treatment for *Bactrocera jarvisi*)*****[479]*PT 5 (Irradiation treatment for *Bactrocera tryoni*)*****[480]*PT 14 (Irradiation treatment for *Ceratitis capitata*)** |
| ***[481]*IRDN 3** | ***[482]*116** | ***[483]*PT 33 (Irradiation treatment for *Bactrocera dorsalis*)** |
| ***[484]*IRDN 4** | ***[485]*150** | ***[486]*PT 7 (Irradiation treatment for fruit flies of the family Tephritidae (generic))** |
| ***[487]*IRDN 5** | ***[488]*166** | ***[489]*PT 45 (Irradiation treatment for *Pseudococcus jackbeardsleyi*)** |
| ***[490]*IRDN 6** | ***[491]*231** | ***[492]*PT 19 (Irradiation treatment for *Dysmicoccus neobrevipes*, *Planococcus lilacinus* and *Planococcus minor*)** |

***[493]****Notes:* Options in bold are **PTs** (phytosanitary treatments adopted as annexes toISPM 28 (*Phytosanitary treatments for regulated pests*)): **PT**s are adopted by the Commission on Phytosanitary Measures (CPM); other treatments included in the table meet the criteria in ISPM 46 (*Commodity-specific standards for phytosanitary measures*) but are not adopted by the CPM.

***[494]***National plant protection organizations should also refer to ISPM 18 (*Requirements for the use of irradiation as a phytosanitary measure*).

***[495]****Sources:* See section 5.1.

***[496]*Table 5.** Options for systems approaches (SAs)

|  |  |  |
| --- | --- | --- |
| ***[497]*Systems approach number** | ***[498]*Independent measures** | ***[499]*References** |
| ***[500]***SA 1 | ***[501]***As set out in ISPM 35 | ***[502]***ISPM 35 (*Systems approach for pest risk management of fruit flies (Tephritidae)*) |
| ***[503]***SA 2 | ***[504]****Pre-planting control measures* (e.g. area of low pest prevalence)***[505]****Growing period control measures* (e.g. field inspection for discoloration of the pseudostem and peduncle, followed by corrective actions; fruit bagging) | ***[506]***ISPM 14 (*The use of integrated measures in a systems approach for pest risk management*)***[507]***[Additional reference pending] |
| ***[508]***SA 3 | ***[509]****Pre-planting control measures* (e.g. area of low pest prevalence)***[510]****Growing period control measures* (e.g. fruit bagging;pest monitoring and pest management in production sites)***[511]****Post-harvest and handling control measures* (e.g. pest monitoring and pest management in packing houses;post-harvest dip treatment; washing, disinfecting, grading, drying). | ***[512]***GACC (2022a, 2022b)***[513]***ISPM 14***[514]***SDA (2005) |

***[515]****Note:* National plant protection organizations should also refer to ISPM 14.

***[516]****Sources:* See section 5.1.

***[517]***5. Bibliography

***[518]***5.1 References

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***[555]***Potential implementation issues

***[556]***This section is not part of the standard. The Standards Committee in May 2016 requested the secretariat to gather information on any potential implementation issues related to this draft. Please provide details and proposals on how to address these potential implementation issues.

***[557]***This appendix is for reference purposes only and is not a prescriptive part of the standard.

***[558]***APPENDIX 1: Bunches, hands and clusters of *Musa* spp.

***[559]*Figure 1.** Bunches of *Musa* spp.

***[560]****Source:* Servicio Agrícola Y Ganadero, Chile.

***[561]*****Figure 2.** Hand of *Musa* spp.

***[562]****Source:* Servicio Nacional De Sanidad Agropecuaria E Inocuidad Alimentaria, Bolivia.

***[563]*Figure 3.** Clusters (parts of hands) of *Musa* spp

***[564]****Source:* Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas, Paraguay.