



NAPPO Regional Standards for Phytosanitary Measures (RSPM)

RSPM N° 16 Guidelines for the Importation of Citrus Propagative Material into a NAPPO Member Country

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October 17, 2004

Contents

	Page
Review	3
Endorsement	3
Effective Date	3
Amendment Record	3
Distribution	3
Introduction	
Scope	4
References	4
Definitions, Abbreviations, Acronyms	4
Outline of Requirements	6
1. General Requirements	6
2. Specific Requirements	6
2.1 Certification/Registration Programs for Sources of Citrus Propagative Materials	6
2.2 Roles and Responsibilities	6
2.3 Terminology	6
2.4 Agronomic Requirements	7
2.5 Isolation and Sanitation	7
2.6 Inspection and Testing	7
2.7 Documentation, Identification and Labeling	7
2.8 Quality System	7
2.9 Permits	7
2.10 Testing	7
2.11 Eligibility for Export of Citrus Propagative Materials	8
2.12 Non-compliance and Remedial Measures	8
2.13 Bilateral Agreements	8
 Appendix 1: Significant Diseases and Pathogens of Citrus Propagative Material: Presence or Absence in Citrus Producing NAPPO Member Countries and Acceptable Diagnostic Tests.	9
 Appendix 2: Insects, Mites and Nematodes of Importance for Citrus Propagative Material: Presence or Absence in Citrus Producing NAPPO Member Countries and Acceptable Identification Tests.	11

Review

NAPPO Regional Standards for Phytosanitary Measures are subject to periodic review and amendment. The next review date for this NAPPO standard is 2009. A review of any NAPPO Standard may be initiated at any time upon the request of a NAPPO member country.

Approval

This standard was approved by the North American Plant Protection Organization (NAPPO) Executive Committee on October 17, 2004, and is effective immediately.

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Implementation

No Implementation Plans are required as only minor revisions have been made to this standard.

Amendment Record

Amendments to this Standard will be dated and filed with the NAPPO Secretariat. The most recent version will be posted on the NAPPO website at: www.nappo.org/stds_e.htm

Distribution

This standard is distributed by the Secretariat of the NAPPO within NAPPO, including Sustaining Associate Members and Industry Advisory Groups, to the FAO IPPC Secretariat, to the ICGPP, and to the Administrative Heads of the Regional Plant Protection Organizations (RPPOs).

Introduction

Scope

This standard establishes the guidelines for the importation of citrus propagative material into NAPPO countries.

It deals with viruses, virus-like agents, viroids, spiroplasmas, phytoplasmas, bacteria and fungal pests, as well as insects, mites and nematodes of citrus propagative material.

References

Determination of Pest Status in an Area, 1999. ISPM No. 8 FAO, Rome
Guidelines for Pest Risk Analysis, 1996. ISPM No.2, FAO, Rome.
Guidelines for Surveillance, 1998. ISPM No. 6. FAO, Rome.
Glossary of Phytosanitary Terms, 2004. ISPM No. 5, FAO, Rome
Glossary of Phytosanitary Terms, 2004. RSPM N° 5, NAPPO.
Requirements for the Establishment of Pest Free Areas, 1996 ISPM No. 4, FAO, Rome
Requirements for the Establishment of Pest Free Places of Production and Pest Free Production Sites, 1999. ISPM No. 10, FAO, Rome.
The Accreditation of Laboratories for Phytosanitary Testing, 1998, RSPM N° 9, NAPPO.
Principles of Plant Quarantine as Related to International Trade, 1995, ISPM No 1, FAO, Rome

Definitions, Abbreviations, Acronyms

Citrus certification/ registration program	An officially approved program for the production of citrus propagative material according to the applicable NPPO standards (NAPPO)
Citrus Propagative Material	Plant parts (budwood, seeds or cuttings) for sexual or asexual reproduction (NAPPO)
Elisa	Enzyme - linked Immunosorbent Assay
Germplasm	Plants intended for use in breeding, research or conservation programs (NAPPO)
IPPC	International Plant Protection Convention as deposited with the FAO in Rome in 1951 and as subsequently amended (FAO)
NPPO	National Plant Protection Organization (FAO)
Official	Established, authorized or performed by a National Plant Protection Organization (FAO)

Pest free area	An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained (FAO)
Pest free place of production	Place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period (FAO)
Pest free production site	A defined portion of a place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period, and that is managed as a separate unit in the same way as a pest free place of production (FAO)
Pest Risk Analysis	The process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it (FAO)
Prohibition	A phytosanitary regulation forbidding the importation or movement of specific pests or commodities (FAO)
PCR	Polymerase Chain Reaction
Quality System	Organizational structure, procedures, processes and resources needed to implement quality management (ISO 8402:1994)
Quarantine Station	Official station for holding plants or plant products in quarantine (FAO)
Regulated Non-quarantine Pest	A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party (FAO)
Restriction	A phytosanitary regulation allowing the importation or movement of a specific commodity subject to specific requirements (FAO)
sPAGE	Sequential Polyacrylamide Gel Electrophoresis
Standard	Document established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context (FAO)

Outline of Requirements

This standard describes the general and specific requirements for the importation of citrus propagative materials to reduce the risk of spreading pests into NAPPO member countries.

1. General Requirements

- Citrus propagative materials that are to be imported into a NAPPO country must:
- 1.1 come from sources that are disease tested and certified/registered by NPPO of the exporting country;
 - 1.2 be imported pursuant to specific permit conditions of the importing country; and
 - 1.3 be accompanied by a phytosanitary certificate which confirms that the importing country requirements have been met.

2. Specific Requirements

- 2.1 **Certification/Registration Programs for Sources of Citrus Propagative Materials**
Participating NAPPO countries will maintain a program to test and certify/register all sources from which citrus propagative materials are collected in order to prevent the spread of specific diseases that are transmitted by these propagative materials.

These certified/registered sources may be maintained by the NPPO, or its designated agency e.g. State, university or private entity. Lists of certified/registered sources shall be provided to the importing country annually. Any change in the certification/registration program or the list of approved sources shall be reported immediately to the NPPO of the importing country.

- 2.2 **Roles and Responsibilities**

The NPPO or its designated agency shall specify the roles and responsibilities of all individuals and organizations participating in the certification/registration program, including laboratories. The NPPO or its designated agency shall also ensure that all staff employed in the program meet appropriate training, experience, educational, and proficiency requirements. A designated agency shall inform its country's NPPO of any changes to its certification/registration program, including testing procedures. The NPPO will notify other participating NAPPO member countries of changes to the certification/registration program and/or the list of approved sources.

- 2.3 **Terminology**

The citrus certification/registration program of each NAPPO country shall contain a section in which all terminology specific to that program will be defined in sufficient detail for a clear understanding of the requirements. To the extent possible, NAPPO countries should harmonize terminology and its use.

2.4 Agronomic Requirements

The citrus certification/registration program shall require that sources of citrus propagative material be kept in good agronomic condition.

2.5 Isolation and Sanitation

Certified/registered citrus propagative material must be grown in a Pest Free Area, pest free place of production or pest free production site.

2.6 Inspection and Testing

The citrus certification/registration program shall specify the inspection and testing requirements for certified/registered citrus propagative material. Collection of samples and laboratory analysis for pests should be done as necessary at the appropriate time of the growing season for detection of these pests and using approved methods. (See Appendixes 1 and 2)

2.7 Documentation, Identification and Labeling

The certification/registration program shall develop, use and retain forms for reporting inspection, and testing results to ensure eligibility and status of production areas, certification of laboratories, and compliance with regulatory requirements of the certification/registration program. Records of location and identity of propagative material must be maintained for at least 5 years.

2.8 Quality System

The NPPO shall ensure that a quality system is in place to ensure validity and reliability of the certification/registration program.

2.9 Permits

Permits are required for all importation of citrus propagative material into NAPPO member countries. Permits may require that approved testing for specified pests be conducted at origin, destination or both. The choice as to where testing is to be conducted is the decision of the importing country. At a minimum, permits will specify the facilities where propagative material will be held prior to release. Permits may also be used to establish levels of quarantine security required in order to handle the propagative material, so that only approved facilities will be used.

2.10 Testing

Imported citrus propagative material may be subjected to testing in the country of origin and/or upon arrival or final destination in the importing country, (see Appendix: Pests, Pest Status, and Diagnostic Tests approved by NAPPO) using approved diagnostic tests in laboratories accredited according to the NAPPO Regional Standard for Phytosanitary Measures No. 9, *The Accreditation of Laboratories for Phytosanitary Testing*.

2.11 Eligibility for Export of Citrus Propagative Materials

All sources wishing to supply citrus propagative materials for export must be approved by their NPPO. Prior to export, representatives of the NPPO of the importing country, or their designates, may inspect and/or test potential sources of citrus propagative material. Only those sources approved by the importing country will be permitted to export citrus propagative material.

2.12 Non-compliance and Remedial Measures

Approval may be suspended pending determination of the extent of non-compliance and the determination of what remedial measures are necessary to reinstate the source of citrus propagative materials. Criteria for reinstatement should be included in the NPPOs certification/registration program. A bilateral workplan may be required to identify the specific actions to be taken for reinstatement.

2.13 Bilateral Agreements

Exporting and importing country NPPOs may decide that a bilateral agreement is necessary to elaborate on these guidelines. Modifications to these guidelines should be technically justified.

**Appendix 1: Significant Diseases and Pathogens of Citrus Propagative Material:
Presence or Absence in Citrus Producing NAPPO Member Countries and
Acceptable Diagnostic Tests.**

DISEASE	PATHOGEN	PRESENCE/ABSENCE		ACCEPTABLE DIAGNOSTIC TESTS
		USA	MEXICO	
	<u>Viruses</u>			
Tristeza (Quick decline, Stem pitting, Seedling yellows)	<i>Citrus tristeza closterovirus</i> (CTV)	P4 and P9 (CA)	P4 and P9	Index on Mexican lime and/or Inmunopresion or ELISA
Psorosis A, & B (including ringspot)	<i>Citrus psorosis ophiovirus</i> (CPsV)	P4	P4	Index on sweet orange or Dweet Tangor
Infectious Variegation Leaf rugose Crinkly leaf	<i>Citrus variegation ilarvirus</i> <i>Citrus leaf rugose ilarvirus</i> <i>Citrus crinkly leaf ilarvirus</i>	P5 (FL)	Ab1	Index on lemon (eureka) seedlings, sour orange and citron.
Leprosis	<i>Citrus leprosis rhabdovirus</i> (CiLV)	Ab2 (FL)	P5, P10 (CHIS, TAB)	Index on sweet orange seedling, TEM, RT-PCR
Satsuma dwarf	<i>Satsuma dwarf virus</i> (SDV)	Ab1	Ab1	Index on Satsuma mandarin, Tangor Dweet, White sesame (<i>Sesamum indicum</i>), ELISA
Tatter leaf-Citrange stunt	<i>Apple stem grooving capillovirus</i> (ASGV) syn. Citrus tatter leaf virus (CTLV)	P5 (CA, AZ, TX and FL)	Ab1	Index on Rusk citrange, <i>Citrus excelsa</i> .
Leaf blotch and Dweet Mottle	<i>Citrus leaf blotch virus</i> (CLBV) Dweet mottle virus (DMV)	P5 (FL)	Ab1	Index on Dweet tangor, RT-PCR
Yellow mosaic	<i>Citrus yellow mosaic badnavirus</i> (CYMV)	Ab1	Ab1	Index on mosambi and satgudi sweet orange or pummelo seedlings, ELISA
	<u>Viroids</u>			
Exocortis	<i>Citrus exocortis viroid</i> (CEVd)	P4	P4	Index on Etrog citron Arizona 861-S1
Cachexia, Xyloporosis	<i>Hop stunt viroid</i> (HSVd) Citrus variants of HSVd: Citrus viroid IIb & IIc (CVd-IIb & -IIc)	P4	P4	Etrog citron Arizona 861-S1 for tissue production used in RT-PCR or Imprint Hybridization
Various citrus growth abnormalities and symptomatologies related to citrus viroids	<i>Citrus bent leaf viroid</i> (CBLVd)-syn. CVd-I HSVd-Citrus variant: CVd-IIa <i>Citrus viroid III</i> (CVd-III) <i>Citrus viroid IV</i> (CVd-IV)	P4	Ab1	Index on Etrog citron Arizona 861-S1 and tissue production used in RT-PCR or Imprint Hybridization for HSVd-Citrus variant: CVd-IIa

	<u>Bacteria</u>				
Citrus Canker	<i>Xanthomonas axonopodis</i> pv. citri	P5 and P9 (FL)	Ab1		Culturing, ELISA, PCR, detached leaf bio-assay
Huanglongbing (Citrus greening)	<i>Candidatus Liberibacter</i> sp.	P5 and P9 (FL)	Ab1		Index on sweet orange seedling, PCR, Hybridization (DNA)
Citrus variegated chlorosis (CVC)	<i>Xylella fastidiosa</i> (CVC Strain)	Ab1	Ab1		PCR + sequencing and culturing
	<u>Phytoplasmas</u>				
Stubborn	<i>Spiroplasma citri</i>	P5 (CA,AZ)	Ab1		Culture
Witches'-broom	<i>Candidatus Phytoplasma</i> <i>aurantifolia</i>	Ab1	Ab1		Indexing on Mexican Lime, PCR
	<u>Uncharacterized- Unknown</u>				
Citrus Chlorotic Dwarf	Uncharacterized, probable virus (Citrus chlorotic dwarf virus)	Ab1	Ab1		Indexing on rough lemon
Sudden death	Unknown, probable Tymovirus (Citrus sudden death- associated virus)	Ab1	Ab1		No accepted diagnostic test. For Tymovirus: PCR
Australian Dieback	Uncharacterized, probably phytoplasma	Ab1	Ab1		Index on sweet orange or grapefruit, PCR
Vein enation-Woody gall	Unknown, probable Luteovirus	P5 (CA)	Ab1		Index on Mexican lime, sour orange
Gummy Bark	Unknown, probable CVd-IIc variant	Ab1	Ab1		Index on sweet orange
Blight	Unknown	P5 (FL)	P5 (YUC)		No accepted diagnostic test. Dot immunobinding assay (DIBA)
Concave gum	Unknown	P5 (CA)	Ab5		Index on Dweet tangor or sweet orange seedlings
Cristacortis	Unknown	Ab1	Ab1		Index on sweet orange or Orlando tangelo
Impietratura	Unknown	Ab1	Ab1		Index on sweet orange or Dweet tangor

[1] Presence or absence, unless otherwise noted, conform to the categories listed in the International Standard for Phytosanitary Measures # 8, entitled "*Determination of Pest Status in an Area*". For ease of reference alpha-numeric designations have been added here.

Ab1: Absent: no pest records
 Ab2: Absent: pest eradicated
 Ab3: Absent: pest no longer present

RSPM N° 16

Guidelines for the Importation of Citrus Propagative Material into a NAPPO Member Country

- Ab4: Absent: pest records invalid
- Ab5: Absent: pest records unreliable
- Ab6: Absent: intercepted only
- Ab7: Absence: confirmed by survey
- Ab8: Absence: pest free area declared

- P1: Present: in all parts of the area
- P2: Present: only in some areas
- P3: Present: except in specified pest free areas
- P4: Present: in all parts of the area where host crop(s) are grown
- P5: Present: only in some areas where host crop(s) are grown
- P6: Present: only in protected cultivation
- P7: Present: seasonally
- P8: Present: but managed
- P9: Present: subject to official control
- P10: Present: under eradication
- P11: Present: at low prevalence.
- P12: Present: not associated with host crop (NAPPO category)

**Appendix 2: Insects, Mites and Nematodes of Importance for Citrus Propagative Material:
Presence or Absence in Citrus Producing NAPPO Member Countries and
Acceptable Identification Tests.**

Scientific name	Common Name	Common name us	Family	Presence/Absence		Diagnostic
				US	Mexico	
<i>Panonychus citri</i> (McGregor)	Ácaro de los cítricos	Citrus red mite	Tetranychidae	P1 (CABI/EPPO 1964; Jeppson et al. 1975)	P2 Puebla and Veracruz (González and Sifuentes, 1972)	Microscopic analysis
<i>Polyphagotarsonemus latus</i> (Banks)	Ácaro amarillo	Broad mite	Tarsonemidae	P1 (CABI/EPPO 1986)	P12 (CABI, 2003)	Microscopic analysis
<i>Tetranychus cinnabarinus</i> (Boisduval)	Araña roja	Carmine spider mite	Tetranychidae	P1 (CABI/EPPO 1996)	P1 (Urias-Lopez and Sevacherian 1984)	Microscopic analysis
<i>Tetranychus urticae</i> (Koch)	Acaro común	Twospotted mite	Tetranychidae	P1 (CABI/EPPO 1996)	P1 (IIE 1996)	Microscopic analysis
<i>Eotetranychus sexmaculatus</i> (Riley)	Ácaro de los seis puntos	Sixspotted mite	Tetranychidae	P2: AZ, CA, FL (Jeppson et al. 1975)	AB1 (CABI, 2003)	Microscopic analysis
<i>Ferrisia virgata</i> (Cockerell)	Cochinilla enbandada	striped mealybug	Pseudococcidae	P1: CA, FL, LA, MD, MS, NM, PA, TX (CABI/EPPO 1966)	P2 (CIE 1966, Ben-Dov 1994)	Microscopic analysis
<i>Maconellicoccus hirsutus</i> (Green)	Cochinilla rosada	Pink hibiscus mealybug	Pseudococcidae	P2 CA, FL, HI (unpublished)	P2 (BC, Nay) (Anon 2000, EPPO 2003, DGSV, 2004)	Microscopic analysis
<i>Planococcus citri</i> (Risso)	Cochinilla harinosa de los cítricos	Citrus mealybug	Pseudococcidae	P1 (CABI/EPPO 1999)	P2 (Ver, NL) (Rico-Gray and Thien 1989, EPPO 2003)	Microscopic analysis
<i>Pseudococcus longispinus</i> (Targioni Tozzetti)	Chinche harinosa	Long-tailed mealybug	Pseudococcidae	P1 (CABI/EPPO 1984)	P2 (Ben-Dov 1994)	Microscopic analysis
<i>Aonidiella aurantii</i> (Maskell)	Escama roja de California	California red scale	Diaspididae	P1: AZ, CA, FL, TX (CABI/EPPO 1996)	P2 (Rose 1990, IIE 1996, EPPO 2003)	Microscopic analysis
<i>Aonidiella citrana</i> (Coquillett)	Escama amarilla de los cítricos	Yellow scale	Diaspididae	P2: CA, FL, TX (CABI/EPPO 1997)	P2 (CABI/EPPO 1997, EPPO 2003)	Microscopic analysis
<i>Quadraspidiotus perniciosus</i> (Comstock)	Piojo de San José	San José scale	Diaspididae	P1 (CABI/EPPO 1986)	P2 (Borchsenius 1966, EPPO 2003)	Microscopic analysis

<i>Icerya purchasi</i> (Maskell)	Escama algodonosa de los cítricos	Cottony cushion scale	Margarodidae	P1 (CABI/EPPO 1971)	P2 (CIE 1971, EPPO 2003)	Microscopic analysis
<i>Coccus hesperidum</i> Linneo	Escama parda blanca	Brown soft scale	Coccidae	P1 (CABI/EPPO 1972)	P2 (Ben-Dov 1993)	Microscopic analysis
<i>Scirtothrips citri</i> (Moulton)	Thrips del naranjo	Citrus thrips	Thripidae	P2: AZ, CA, FL (CABI/EPPO 1961; S. Nakahara unpublished {FL})	P2 Son, Tamps; NL (CIE 1961, EPPO 2003; Johansen N., 1998)	Microscopic analysis
<i>Toxoptera citricida</i> (Kirkaldy)	Pulgón café de los cítricos	Brown citrus aphid	Aphididae	P2: FL, HI (CABI/EPPO 1998)	P2 Q. Roo, Yuc, Camp, Tab, Ver (CABI/EPPO 1998, EPPO 2003; DGSV, 2004)	Microscopic analysis
<i>Tylenchulus semipenetrans</i>	Nematodo de los cítricos	Citrus Nematode	Tylenchidae	P2: AZ, CA, FL, HI, LA, TX (Baines et al 1978; Duncan and Cohn 1990)	P1 (Gonzales and Herrera 1970, EPPO 2003)	Microscopic analysis
<i>Rhadopholus citrophilus</i>	Nematodo de la declinación de los cítricos	Burrowing nematodes	Pratylenchidae	P2: FL, HI, LA, TX (Duncan and Cohn 1990; see also Kaplan and Opperman 1997, Kaplan et al 1997)	P1 (Taboada and Caballero 1968; CABI/EPPO 1999, EPPO 2003)	Microscopic analysis
<i>Rhadopholus similis</i>	Nematodo barrenador del plátano	Burrowing nematodes	Pratylenchidae	P2: FL, HI, LA, TX (Duncan and Cohn 1990; see also Kaplan and Opperman 1997, Kaplan et al 1997)	P1 (Taboada and Caballero 1968, CABI/EPPO 1999, EPPO 2003)	Microscopic analysis
<i>Xyphinema americanum</i>	Nematodo daga Americano	Dagger nematode	Longidoridae	P1: CA, plus widespread in most other U.S. status (Duncan and Cohn 1990)	P1 EPPO. 1999	Microscopic analysis
<i>Xyphinema index</i>	Nematodo daga vector de virus en viñedos	Dagger nematode	Longidoridae	P2: CA only (McKenry 1992)	Ab1 Crop Protection Compendium 2000	Microscopic analysis

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P6: Present: only in protected cultivation
P7: Present: seasonally
P8 Present: but managed
P9 Present: subject to official control
P10: Present: under eradication
P11: Present: at low prevalence.
P12: Present: not associated with host crop (NAPPO category)

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