



UNION DES COMORES
Unité-Solidarité-Développement

VICE PRESIDENCE EN CHARGE DU MINISTERE DE L'AGRICULTURE, DE LA PECHE
DE L'ENVIRONNEMENT, DE L'ENERGIE ET DE L'ARTISANAT

STATE OF THE SEED SECTOR IN THE COMOROS



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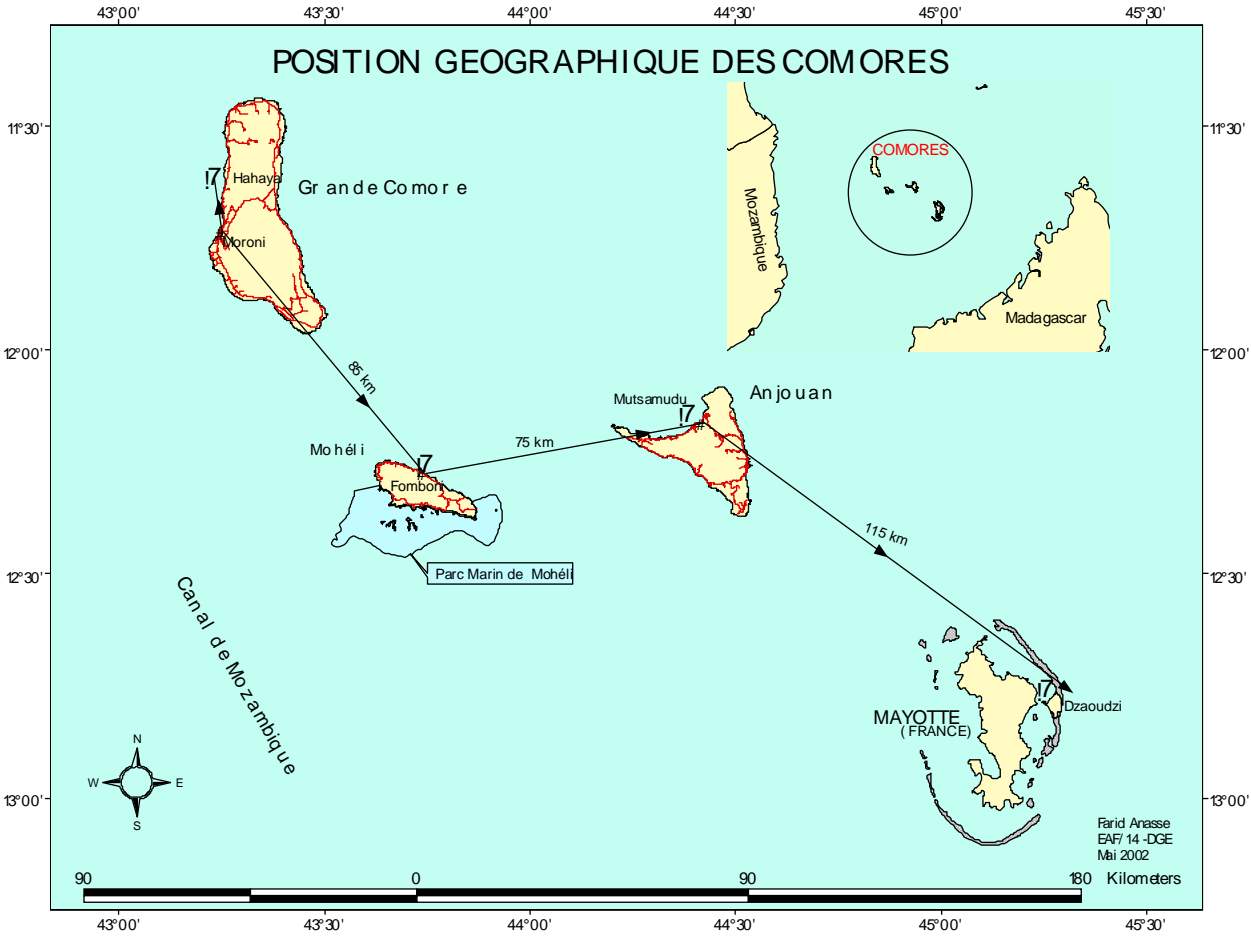
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GEOGRAPHICAL POSITION OF THE COMOROS



1. INTRODUCTION

The Common Market for Eastern and Southern Africa (COMESA) following the Meeting of Ministers of Agriculture held in Seychelles in 2008 mandated AFSTA (African Association on seeds) to deal with harmonization on seed in the 19 member countries of COMESA including Comoros.

The objective is to harmonize seed regulations at COMESA level to promote cross-boarder seed trade for a better supply for farmers in the COMESA region.

Agriculture accounts for 40 to 50% of GDP in Comoros
Importation of most food staples (rice, flour)
Self-sufficiency in tubers
Import seed through cooperatives and informal sector
Local production of seeds in the field
Annual seed demand: 30 tons.

The Purchasing Center for Comorian Farmers (CAPAC) orders and distributes certified seed to the farmers' grouping.

The Law No. 95-09/AF related to the creation, the organization and the operation of INRAPE (National Research Institute for Agriculture, Fisheries and Environment) states that one of the missions of this institute is to make respect the standards, to analyze the products and to issue plant and animal import permit and authorization.

2. BACKGROUND

In 1981, the World Bank funded coconut project was launched. One component of this project is the rehabilitation of the coconut.

From 1982 to 1985, the project infrastructure was created with the plantation of seed field and the field for testing the behaviour.

In 1985, the exploitation of seed field started. The first seed lot was produced in 1986 and the first seedling was planted in 1987.

The exploitation stopped in the beginning of 1988 because 200,000 seedlings were produced of which 35,000 were exported. These seedlings covered from 1987 to 1991 nearly 550 ha. The technique used was that of assisted pollination for hybrid seed production like the hybrid PB121 (intersection of Grand Comoros and Malayan Yellow Dwarf).

From 1988 to 1989 the maize development project

After several trials of some varieties, it appears that the best variety is HK.241D (red grains) with a better yield for the lowland. These varieties are from Burkina Faso.

From 1980 to 1990 seeds were ordered by the Federal Centre for Rural Development Support. (CEFADER).

In 1994, there was a problem of structural adjustment and the number of the staff of CEFADER decreased from 1100 to 130.

A new structure was set up in 1995, which was the INRAPE (National Institute of Research for Agriculture, Fisheries and Environment) by law 95-09/AF.

From 1996 to 2000, the project PAFIA: Project for reinforcement of Agricultural Inputs funded by the AFD (French Development Agency). The PAFIA had three components:

Component 1: Creation of an autonomous network near the zones where there is a high demand in seed

Component 2: importation

Identify private operators with financial and technical capacity to import agricultural inputs. Unfortunately, these operators were not cooperative. Therefore, there was a creation of a network of users of agricultural inputs called ZANA ZEMA in July 2000 (these are groupings of villagers).

Component 3: Institutional Support

It was to support the Ministry of Agriculture on the management of public donations of agricultural inputs. To do so, a joint committee of management of agricultural donations was created and composed of:

- One representative of the Ministry of Production
- One representative of the Ministry of Economy and Finance
- Representatives of private sector(ZANA, ZEMA, VOUNA DJEMA)

The role of this committee is:

- Study the donation request for agricultural inputs
- Set up the prices of the reimbursements
- Entrust the physical management of donations to a private operator

Following the formation of this committee, a bid was launched to call for any persons who would like to sell these agricultural inputs based on the conditions set up by the committee.

Under the third component of the project PAFIA, a stock-taking of the inputs, equipment and tools in the three islands was conducted.

In 1996 the Project DECVAS (Food crop Development and reinforcement of the Seed) funded by the European Union had two components:

- A component “seed”
- A component “extension”

For the component “seed”, the expected result is the establishment of a network of seed producers. The project helped them to become independent and worked on their own nursery.

The project had two approaches:

- Local production of seedlings by local nursery
- Group that buys and sells seeds from abroad

For food component of the DECVAS Project (Jan – Feb - March 2003)

Introduction of vitro plant 32,000 in late January and distributed in the three islands.

There was no list of released varieties but rather performing varieties to be vulgarized.

INRAPE controls the germination rate and issue the seed import permit seed

One of the failures found is storage

In 1998 the draft law on the protection of plants is developed (Gilbert Theissen Consultant)

As there was no time for National Assembly, the bill remained dormant until 2006. This bill through its component 2 (Legislation) PRPV program funded by the European Union is presented to the National Assembly in the beginning of December 2006

This law is promulgated by the President of the Comoros Ahmed Abdallah Mohamed Sambi on 21st December 2006. Decree No. 06-220/PR promulgating the Law No. 06-010/AU on 2nd December 2006.

Since 2002, CAPAC imported potato seeds from France. They are supplied by the Desmazières à ARRAS and produced by the Trade-Union Artois Bapaume in the North of France.

In 2007, two containers of 15 tons of seeds were ordered and delivered. These were basic seed Elite Class and the diameter is about 35/45 mm. The seeds are excellent for meeting the most stringent production conditions especially compared to the percentage of diseases allowed that seed certified as Class A or B. Indeed, the European regulations and the annex of technical regulations of seed production of potato of the SOC allow from 0.5 to 1% of observation of infected plants by *Erwinia carotovora* var. *atroseptica* in seed production plots of basic class Elite. Only seeds of class Super Elite have a zero tolerance to *Erwinia carotovora*.

In 2007 The National Farmers Union Comorians (SNAC), which includes the majority of producers, wanted to start the export of potato for consumption on the island of Mayotte. To achieve this objective, the production in 2007 was doubled. Thirty tonnes of certified seed of the variety Désiré were imported and cultivate on the two islands (Anjouan and Grande Comoros) with the same quantity for each island.

While production was low in Anjouan, it was practically zero in Grand Comoros where on many plots, almost all plants were destroyed by unknown disease in early stage of the cycle.

A. SEED CERTIFICATION STANDARDS

a) Responsible for the seed certification

The Head of the certification is INRAPE (National Research Institute for Agriculture, Fisheries and Environment)

Email: inrape@yahoo.fr

Tel: (00269) 7633068

Address: B.1406 Moroni Comoros

b) The existing seeds

The Main crops are:

- Plants with root and tuber crops (potatoes, yams, cassava, sweet potato, and arrow root)
- Pulses (pigeon pea, bean, peanut, mung bean, lentil, and cowpea)
- Cereals (maize, rice)
- Vegetables (tomato, onion, pepper, carrot, cabbage, cucumber, and melon)

c) For the harvest (moisture content, germination, diseases, etc.)

The phytosanitary is the main barrier. The problems encountered on the Seeds are:

- Storage problem and sorting of agricultural products;
- No seed selection;
- No respect of criteria of quality
- No specific purity for seed (example maize)
- No varietal purity (one year after planting)
- Low germination rate
- Low yield
- Increased variety degeneration (cases of maize and potato)

d) Future plan for seed certification

There is no national plan for seed certification. There is neither law nor draft law for seed in Comoros. Whereas Comoros has a phytosanitary law and only the application decree is missing.

B. VARIETY EVALUATION AND RELEASE

a) Responsible for variety evaluation and release

Currently, the Comoros does not produce seeds from released varieties. The INRAPE issues seed permit.

b) Existing Varieties

- Three varieties of open pollinated maize imported from Nigeria with production potential of 30 to 35 quintaux/ha: TZ-W, SR-1, TZ-PB-Suakoko.
- One variety of potato (variétéPB-1)
- Two varieties for French bean (variety contades and Albert)

The unavailability of seeds of the variety Noflaye, which yielded good results in Grande Comore and Anjouan, the NDMS and CAPAC decided to import seed of the variety Red of Tana in 2008. The SEMOI (Seed of Indian Ocean) was able to supply 25 to 30 kg of seeds of the variety Veronique Noflaye identical to the variety and already tested in the Comoros.

c) For the harvest (moisture content, germination, diseases, etc.)

At harvest the first problem is the storage and marketing. The INRAPE prepared the necessary documents.

Different techniques of seed production:

- Genetic improvement of seed
- Conservation of Plant Genetic Resources
- Micro propagation of seedlings

The main problems encountered in the potato seed production were related to nematodes, mildew and in conservation, Mealybugs of pineapple.

d) Futur plan for variety evaluation and release

There is no plan for variety evaluation and release

C. PHYTOSANITARY MESURES

a) Responsible for phytosanitary measures

INRAPE is in charge of the phytosanitary measures

b) Crops subject to phytosanitary measures

- Vegetables (zucchini, cabbage, lettuce, tomato, cucumber, carrots, peas)
- Potato
- Cereals (maize)
- Legumes (French bean)

c) For the harvest (moisture content, germination, diseases, etc.)

The plant protection service of the INRAPE is the organization designated by the competent authority for the enforcement of legislation. The regulation is based on the Comoros publication (ministerial and prefectural Bylaws)

The regulations stipulates:

- The detailed procedures and all technical requirements
- The roles and missions of each partner concerned by the law
- Guidelines for surveillance of pests and preparation for regulatory measures as directed by the application decree

The PRPV project has a life span of 5 years and one of the results was the elaboration of phytosanitary legislation that was promulgated by the President. The regional harmonization of phytosanitary legislation, PRPV was also an outcome of this project (see Annex6)

D. PLANT VARIETY PROTECTION (INTELLECTUAL PROPERTY RIGHTS)

INRAPE being a Research Institution has the intellectual property rights but there is no law for the protection of new plant variety.

The local seed producers shared among themselves seeds. Farmers sow the grains of the previous harvest. This is the case for onions, potato, cassava, yams, peanut and pulses. Farmers used vegetative propagation (banana, cassava, arrowroot, coconut, breadfruit, paddy) and the propagation by grafting, cuttings and assisted pollination.

E. SEED IMPORT/EXPORT DOCUMENTATION AND PROCEDURES

a) INRAPE (inrape@yahoo.fr)

The service of plant protection of INRAPE is the organization designated to establish the seed certification, to determine the germination rate and the moisture content. The Comoros is mainly potato and vegetable seed importer.

The Comoros only export cash crops such as vanilla, cloves and ylang-ylang.

CAPAC¹ and FNAC² order seeds

¹ Central d'Achat Pour les Agriculteurs Comoriens

SNAC³ and FNAC are the two Institutions distributing seeds to farmers
CAPAC is the cooperative of SNAC in charge of the seed supply among others.

b) Existing seeds

Mainly vegetable seeds.
The majority of tuber seeds are locally produced.

c) For the harvest (moisture content, germination, diseases, etc.)

On the health of onion bacterial blight (*Xanthomonas axonopodis* pv. *Allii*) of IYSV (Iris Yellow Spot Virus) or *Botrytis* (*Botrytis squamosa*).
Bacterial Wilt (Bacterial wilt, *Ralstonia solanacearum*)
Different strains of TYLCV in more common diseases of tomato (*Fusarium*, TMV ...).
The main variety used for tomato Comoros Floradade (Technisem). The main problem for the production of tomato is the fruit fly

F. MEMBERSHIP OF INTERNATIONAL ORGANIZATIONS

The Comoros has ratified the Cartagena Protocol in 2009.

3. CONCLUSION AND PERSPECTIVES

It is very important:

- Update existing decrees and implement them
- Standardize Phytosanitary certificates
- Develop synergy between the laboratories in the Region to exchange experience
- Have a file on the regional experts
- Set up control structure and seed certification
- Train farmers and extension workers on seed multiplication and conservation

a) Perspective

- Well defined for the seed sector
- Intensification of seed production under the system of quality declared seed
- Promulgation of seed law
- Promulgation of the law on Intellectual Property Rights
- Consolidation of regional cooperation

b) Constraints

- Lack of qualified personnel

² Fédération Nationale des Agriculteurs Comoriens

³ Syndicat National des Agriculteurs Comoriens

- Lack of a unit of plant breeding
- Lack of a comprehensive policy for seed
- Lack of a seed laws
- No seed quality control for seed locally produced by growers and those imported
- No Intellectual Property Laws

ANNEXES

Annex 1: Annual Seed Importation

Annex 2: Type of seed imported

Annex 3: Quantity of seeds imported by CAPAC

Annex 4: Seed actors

Annex 5: Documentary Resources and Internet links

Annex 6: Objective and expected results from PRPV

Annex 1: Annual Seed Importation

Annual seed importation		
Crops	Package	Average quantity per year
Potato	Cold Container	45 tons
Zucchini	Tin of 100g	6kg
cabbage	Tin of 100g	15kg
Lettuce	Tin of 100g	15kg
Tomato	Tin of 100g	40 kg
Cucumber	Tin of 100g	10 kg
Carrot	Tin of 100g	30 kg
Petsai	Tin of 100g	40kg
Green pepper	Tin of 100g	02kg
Egg plant	Tin of 100g	0,5kg

Leek	Tin of 100g	05kg
Melon	Tin of 100g	02kg
Pepper		30kg
Onion		300kg

Annex 2: Types of imported seeds

Imported seeds	Country of origin	Companies and variety
Tomato, pepper, cabbage, cucumber, bean, melon, zucchini	France	Gauttier technissem
Maize	Reunion Burkina Faso	Revolution, HK.241.D(red grain and best results for lowland) TS.321 Variety:RMP.91(for the highland) and variety RMP.12 Variety TS.321 (22qx/ha)
Potato	Thailand, France and south Africa	
Cassava Vitro plants	Nigeria	
Banana Vitro plants	Israel and Cameroon	
Maize seed revolution	Reunion island	
Yam vitro plant	Cameroon	
Sweet potato	South Africa	
Coconut seedling	Ivory Coast	Big West African, Yellow dwarf of Malaysia, Red dwarf of Cameroon

Annex 3: Quantity of seeds imported by CAPAC

Exercices	2005-2006	2006-2007	2007-2008	2008-2009	Variation
Products	Total	Total	Total	Total	Price in Euro
Tomato	59,2kg	138 kg	32,75 kg	56,3kg	94-99
Carot	24,5 kg	99,3 kg	32 kg	75 kg	39,1 -39 ,1
Cucumber		15,3 kg	10,2 kg	10 kg	38,5
Lettuce	10,2 kg	65 kg	18 kg	12 kg	49,2-49,2
Cabbage	11 kg	43 kg	8 kg	18,5 kg	49,2-49,2
Bean	15 kg	80 kg	40 kg	15 kg	36-36
Sugar beat	1 kg	0,5 kg		0	29,7-29,7
Egg plant	0,5 kg	1,5 kg	2,5 kg	0,2 kg	53-53
Green pepper	0,5 kg	3,5 kg	2 kg	1,5 kg	85-85
Melon				0,5 kg	
Leek	0,5 kg	2,35 kg	1,5 kg	0,5 kg	57,8-57,8
Petsai	5,5 kg	11 kg	2,5 kg	5,5 kg	49,2-49,2
Zucchini	1,5 kg	2 kg	2,1 kg	5,0kg	39,9-39,9
Onion	145kg	131 kg	305,5kg	133kg	51,46-50,4
Total Small seeds	274,4 kg	529 ?4 kg	474,05 kg	346,5 kg	
Potato	27,65T	29,7T	29,600T	30T	385-450

Annex 4: Seed actors

Grande Comores :

- a) Ahmed Abdou Elkader : Executive Director of CAPAC (Central d'Achat des Professionnels Agricoles des Comores) B.P 1473

Tél : Cell : +239 3330234

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- b) Mr. Youssoufa Mohamed Ali, National Focal Point du Plant Protection Program
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Tel : +269 3339176

- c) Mr. Issimaila Mohamed : chef du département protection des végétaux
INRAPE

Email : issimaila63@yahoo.fr

- d) CHADHOULIATI Abdou Chakour : Head of Plant pathology and entomology
Laboratory of INRAPE and Deputy Director of INRAPE

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Address : B.P 1406 Moroni Union Des Comores

- e) Mr. Issa Mhadji Président du SNAC (Syndicat National des Agriculteurs Comoriens)
f) Mr. Ahmed Naussoib : technician GIE ZANAZEMA
Mohéli
Mr. Loutoufi mohamed Responsable for Centre d'Encadrement agricole de Fomboni
Mr. Abdou Soimadou Ali Director of Plant Protection Service of Anjouan
Mr. Ibrahim abdallah charif : Director of Plant Protection
Mr. Saindou kassim : Head of Phytosanitary Inspection

Annex 5: Documentary Resources and Internet links

Report Cuvellier 2008

<http://www.plantdepommedeterre.org/pages/plan.htm>

<http://www.cipotato.org/> : CIP website particularly downloadable file:
<http://www.cipotato.org/publications/>

<http://www.avrdc.org/> : website of AVRDC

For seeds of tomatoes: <http://www.avrdc.org/> Contact for tomato: Dr. Peter Hanson:
hansp@netra.avrdc.org.tw

<http://www.prpv.org/> : website for PRPV (Regional Program of Plant Protection)

Annex 6: Objective and expected results from PRPV

The pest control is not efficient whereas the crops are subject to quasi permanent parasite pressure. The objective of PRPV is to promote and develop operational, scientific and technical cooperation between the countries members of Indian Ocean Commission about the Plant Protection.

Partners of the program

- INRAPE Comoros;
- Plant Protection Services of the Ministry of Agriculture of Madagascar;
- Quarantine and Plant Pathology Division and Entomology Division of the Ministry of Agriculture of Mauritius (AREU and MSIRI)
- Plant Protection Services of the Ministry of Agriculture and CIRAD of Reunion island;
- Plant Protection Services and Plant research and Evaluation of The Ministry of Environment of Seychelles

PRPV had 5 components:

Developed Activities

- Creation of a network of plant protection in Indian Ocean;
- Regional harmonization of phytosanitary legislations;
- Setting up the quality control (planting materials and pesticides);
- Applied research to pesticide experimentation and to alternative methods of control;
- Technical and training support.

Annex 6 :

List 1 A. Quarantine pests of which importation are prohibited when found isolated or in the plants or in plant products:

Bacteria and Phytoplasms

Acidovorax anthurii

Agrobacterium tumefaciens

Candidatus liberobacter africanum

Candidatus liberobacter asiaticum

Cassava witches broom

Clavibacter michiganensis ssp michiganensis

Clavibacter michiganensis ssp sepedonicus

Coconut Lethal yellowing

Curtobacterium flaccumfasciens pv *flaccumfasciens*

Erwinia amylovora

Pseudomonas syringae pv *lisi*

Pseudomonas syringae pv *tabaci*

Pseudomonas syringae pv *glycinea*

Pseudomonas syringae pv *morsprunorum*

Pseudomonas fuscovaginae

Xanthomonas campestris pv *oryzae*

Xanthomonas campestris pv *oryzicola*

Erwinia stewartii

Erwinia tracheiphila

Phytomonas sp (pourriture du Coeur de palmiste)

Pseudomonas syringae pv *lacrymans*

Ralstonia solanacearum race 2 (Moko)

Ralstonia solanacearum Race 3(biovar 2)

Spiroplasma citri

Strawberry lethal decline phytoplasma

Sugarcane grassy shoot phytoplasma

Sugarcane white leaf phytoplasma

Sweet potato little leaf phytoplasma

Xanthomonas axonopodis pv *citri*

Xanthomonas axonopodis pv *differbachiae*

Xanthomonas axonopodis pv *passiflorae*

Xanthomonas campestris pv *fragariae*

Xanthomonas campestris pv *musacearum*

Fungi

Cronartium spp

Deuterophoma tracheiphila

Exobasidium vexans

Fusarium oxysporum f.sp *cubense*

Mycosphaerella fijiensis

Peronosclerospora virus litchii

Peronosclerospora maydis

Peronosclerospora philippinensis

Peronosclerospora sacchari

Peronosclerospora sorghi

Peronospora hyoscyami fsp *tabacina*

Phytophthora fragariae pv *fragariae*

Phytophthora infestans A2

Synchytrium endobioticum

Urocystis cepulae

Sphaceloma arachidis

Phytophthora megasperma f.sp. glycinea

Insects and Mites

Acalymma trivittata
Acyrtosiphon pelargonii
Acyrtosiphon pisum
Aleurocanthus woglumi
Aleurocanthus zizyphi
Aleurodicus destructor
Aleurodicus dugesii
Aleyrodes protella
Anacridium melanorhodon
Anastrepha fraterculus
Anastrepha grandis
Anastrepha interrupta
Anastrepha ludens
Anastrepha mombinpraeoptans
Anastrepha obliqua
Anastrepha serpentina
Anastrepha striata
Anastrepha suspensa
Anoplophora chinensis
Anoplophora glabripennis
Aonidiella orientalis
Aphis coreopsidis
Aphis glycines
Aphis idaei
Aphis rubifolii
Aphis rumicis
Aphis sesbaniae
Aspidiotus nerii
Atranchya sp
Aulacaspis madiunensis
Aulacaspis yasumatsui
Aulacophora foveicollis
Aulacophora indica
Aulacophora lewisii
Bactrocera correcta
Bactrocera cucumis
Bactrocera dorsalis
Bactrocera dorsalis species complex
Bactrocera invadens
Bactrocera neohumeralis
Bactrocera tau
Bactrocera tryoni
Bemisia tabaci biotype Q
Brevipalpus californicus

Brevipalpus chilensis
Tragoderma granarium
Mononychellus tanajoa
Cacoecimorpha pronubana
Cerataphis orchidearum
Ceratitis cosyra
Ceratitis malgassa
Ceratovacuna lanigera
Ceroplastes ceriferus
Ceroplastes destructor
Ceroplastes rubens
Ceroplastes rusci
Chaetanaphothrips signipennis
Chaetosiphon fragaefolii
Chaetosiphon fragariae
Chaetosiphon tetraerhodum
Chaetosiphon thomasi
Chromatomyia horticola
Chrysodeixis eriosoma
Cochliothrips melolonthoides
Dialeurodes citri
Dialeurodes citrifolii
Danothrips trifasciatus
Eldana saccharina
Eutetranychus orientalis
Epilachna varivestis
Epitrix cucumeris
Frankliniella bispinosa
Frankliniella intonsa
Frankliniella fusca
Frankliniella occidentalis
Frankliniella schultzei
Gynaikothrips ficorum
Hayhurstia atriplicis
Helicoverpa assulta
Hercinothrips femoralis
Heteronychus arator
Heteronychus plebejus
Hoplochelus marginalis
Hylurgus ligniperda
Hysteroneura setariae
Icerya aegyptiaca
Leptinotarsa decemlineata
Leucinodes orbonalis
Liriomyza brassicae
Liriomyza bryoniae
Liriomyza sativae
Lopholeucaspis japonica
Maconellicoccus hirsutus
Macrosiphum pelargonii

Mamestra brassicae
Megalurothrips distalis
Megalurothrips usitatus
Melanoplus differentialis
Myzus ascalonicus
Myzus ornatus
Neoaliturus opacipennis
Neoaliturus tenellus
Nipaecoccus nipae
Parlatoria oleae
Parlatoria pergandii
Paysandisia archon
Perkinsiella vastatrix
Perkinsiella vitiensis
Petrobia latens
Pezothrips kellyanus
Phoracantha recurva
Phthorimaea operculella
Planococcus minor
Planococcus musae
Pseudococcus calceolariae
Pseudococcus comstocki
Pseudococcus jackbeardsleyi
Quadraspidiotus perniciosus
Rastrococcus iceryoides
Rastrococcus invadens
Rhopalosiphon padi
Rhagoletis cerasi
Rhagoletis pomonella
Rhynchophorus ferrugineus
Rhynchophorus phoenicis
Scirtothrips dorsalis
Sesamia cretica
Sitobion fragariae
Symmetrischema tangolias
Tetranychus cinnabarinus
Thrips flavus
Thrips hawaiiensis
Thrips imaginis
Thrips parvispinus
Toxoptera odinae
Trialeurodes ricini
Trialeurodes vaporariorum
Trichoplusia ni
Unaspis yanonensis
Uroleucon ambrosiae
Xylotrupes bajulis
Haplothrips tenuipennis

Rhynchophorus palmarum

Nematods

Anguina tritici
Aphelenchoides besseyi
Aphelenchoides fragariae
Aphelenchoides ritzemabosi
Bursaphelenchus xylophilus
Ditylenchus angustus
Ditylenchus dipsaci
Ditylenchus destructor
Globodera pallida
Globodera rostochiensis
Heterodera schactii
Nacobbus aberrans
Pratylenchus goodeyi
Radopholus citri
Radopholus similis
Rhadinaphelenchus cocophilus
Tylenchulus semipenetrans

Virus and Viroids

Andean potato latent virus
Andean potato mottle virus
Avocado sun blotch viroid
Banana bunchy top virus
Bean golden mosaic virus
Banana bract mosaic virus
Cassava african mosaic virus
Cassava brown streak virus
Cassava common mosaic virus
Chilli veinal mottle virus
Citrus cachexia viroid
Citrus exocortis viroid
Citrus infectious variegation virus
Citrus leaf rugose virus
Citrus psorosis
Citrus tatter leaf virus
Citrus tristeza virus
Citrus vein enation virus
Citrus yellow mosaic virus
Citrus witches' broom
Coconut cadang cadang viroid
Coconut foliar decay virus
Cowpea aphid borne mosaic virus
Cowpea mild mottle virus

Cucumber green mottle virus
Cymbidium mosaic virus
Dasheen mosaic virus
Impatiens necrotic spot virus
Internal cork virus of sweet potato
Lettuce infectious yellows virus
Papaya bunchy top
Papaya ringspot virus P
Pepper mild mottle virus
Pea seed borne mosaic virus
Peanut stripe virus
Peanut rosette virus
Peanut clump virus
Peanut mottle virus
Pelargonium leaf curl virus
Pineapple bacilliform virus
Pineapple wilt virus
Potato spindle tuber viroid
Potato virus T
Potato stolbur
Squash leaf curl virus
Strawberry crinkle virus
Strawberry latent ringspot virus
Strawberry mild mottle virus
Strawberry mild yellow edge virus
Strawberry vein banding virus
Sugarcane fiji disease
Sugarcane mosaic virus
Sweet potato feathery mottle virus
Sweet potato yellow dwarf virus
Sweet potato mosaic virus
Tobacco ringspot virus
Tomato black ring virus
Tomato bushy stunt virus
Tomato ringspot virus
Tomato spotted wilt virus
Tomato yellow leaf curl virus

LISTE 1. B : Non Quarantine pest list

Bacteria and Phytoplasms

Agrobacterium tumefaciens
Candidatus liberobacter africanum
Candidatus liberobacter asiaticum
Pseudomonas savastanoi pv phaseolicola
Pseudomonas syringae pv tomato
X. campestris mangiferae indicae
X. campestris pv vesicatoria
Xanthomonas axonopodis pv citri

Xanthomonas axonopodis pv *phaseoli*
Xanthomonas axonopodis pv *vitians*
Xanthomonas campestris pv *campestris*
Xylella fastidiosa

Fungi

Alternaria dauci
Cercospora kikuchii
Colletotrichum acutatum
Colletotrichum capsici
Mycosphaerella citri
Mycosphaerella eumusae
Mycosphaerella musicola
Phytophthora capsici
Phytophthora colocassiae
Spongospora subterranea f.sp *subterranea*
Stenocarpella macrospora
Stenocarpella maydis

Insects and Mites

Acyrtosiphon solani
Aphis craccivora
Aphis gossypii
Bemisia argentifolii
Bemisia tabaci
Diaphorina citri
Dysmicoccus brevipes
Macrosiphum euphorbiae
Melanaphis sacchari
Myzus persicae
Perkinsiella saccharicida
Phthorimaea operculella
Rhopalosiphum maidis
Saccharicoccus sacchari
Toxoptera citricidus
Trioza erytrae

Nematodes

Meloidogyne arenaria
Meloidogyne hapla
Pratylenchus brachyurus
Scutellonema brachyurum

Virus and Viroids

Banana streak virus
Bean common mosaic virus
Bean yellow mosaic virus
Beet curly top virus
Carnation etch ring virus
Carnation necrotic fleck virus
Carnation ringspot virus
Carnation streak virus
Chrysanthemum stunt viroid
Citrus greening
Citrus tristeza virus
Citrus psorosis virus
Cowpea mild mottle virus
Erwinia chrysanthemi
Lettuce mosaic virus
Odontoglossum ringspot virus
Orchid fleck virus
Squash mosaic virus
Tobacco necrosis virus
Tobacco streak virus
Tomato spotted wilt virus
Vanilla mosaic potyvirus