壹、 前言

臺灣與日本同爲海島型國家，國外之檢疫有害生物因海洋之天然隔絕極少能自行進入，大部分皆經由貿易貨物及人爲攜帶之方式入侵。日本的植物檢疫概念起源於明治天皇時期(西元 1852 年－1912 年)，因蘋果棉蚜(Woolly apple aphid)及箭頭介殼蟲(Arrowhead scale）等有害生物隨著國外輸入之貨物侵入造成農業生產爲害後開始萌芽，並於 1914 年即公佈植物檢疫法規（Plant Quarantine Law)，針對有害生物之入侵、蔓延及撲滅進行管理，目前中央係由農林水產省消費安全局植物防疫課統籌相關防檢疫業務，而實際業務則另於全國設置 5 個植物防疫所、15 個支所、48 個出張所及 4 個植物檢疫辦公室負責執行。由於日本植物檢疫制度建立較我國早，各種檢疫設施及制度規劃亦相當完善，其所累積之經驗頗值得我國學習與借鏡。

行政院農業委員會動植物防疫檢疫局爲使植物檢疫制度及業務更臻完善，選派臺中分局葉濟蒼分局長及植物檢疫組農產品檢疫科許明達科長於 100 年 10 月 25 日至 11 月 2 日赴日本進行參訪。本次行程除拜會我駐日本經濟文化代表處及參訪東京笹塚台灣物產館外，主要拜訪位於東京地區之橫濱植物防疫所，了解其同定制度與同定官之訓練、輸入植物與檢疫有害生物風險評估方式及相關實驗室、輸入活昆蟲之規定及大和隔離檢疫苗圃設施設置情形，並參觀橫濱植物防疫所成田支所貨物檢疫現場及入境旅客檢疫業務。本次參訪所見將作爲動植物防疫檢疫局未來規劃相關檢疫措施之參考。

貳、參訪行程紀要

日　　期	主　要　行　程　內　容
10 月 25 日	14：20 自桃園國際機場啓程，日本時間 18：35 抵達東京成田國際機場，由我國駐日代表處經濟組林榮貴一等秘書接機，隨後即到東京品川王子飯店辦理住宿登錄。
10 月 26 日	上午原定拜會農林水產省消費安全局植物防疫課，惟因當日植物防疫課臨時有重要業務，該課無法抽出人員接待故予以取消。 下午拜會我國駐日經濟文化代表處經濟組，與周立副組長、林榮貴一等秘書及王清要副參事官進行晤談。 夜宿 東京品川王子飯店。
10 月 27 日	上午前往位於橫濱合同廳舍之橫濱植物防疫所，拜會該所小野仁業務部長，並由調查研究部企画調整担当內山亙次席調查官、業務部貨櫃貨物担当增山勇次席植物檢疫官及業務部輸出及國內檢疫担当豬平倫文次席植物檢疫官進行業務簡報雙方並交換意見。 下午拜訪橫濱植物防疫所位於新山下廳舍之辦公室，由有害生物診斷鑑定部門主管鶴田賢治博士針對同定官制度進行簡介及說明。 夜宿 東京品川王子飯店。
10 月 28 日	上午前往橫濱植物防疫所位於新山下廳舍之辦公室，拜會調查研究部君島悅夫部長，並與該部消毒技術開發担当小畠恒夫統括調查官、病菌担当齊藤範彥統括調查官及害虫担当大戶謙二統括調查官進行會談並參觀燻蒸消毒實驗室。 下午繼續於新山下廳舍之辦公室，拜會調查研究部並與該部病虫害危險度評価担当米田雅典統括調查官、病虫害危險度評価担当田中博道次席調查官及農林水產省消費安全局植物防疫課檢疫對策室輸入檢疫担当中園浩一會談，另參觀調查研究部設施。 夜宿 東京品川王子飯店。
10 月 29 日	參訪東京笹塚台灣物產館，並與藤田克己社長及朱亭錚主任就我國農產品輸銷日本相關問題進行意見交換。 夜宿 東京品川王子飯店。
10 月 30 日	資料整理。 夜宿 東京品川王子飯店。
10 月 31 日	上午前往位於橫濱合同廳舍之橫濱植物防疫所，拜會該所業務部種苗担当宮

崎博次席植物檢疫官及種苗担当松尾敬一次席植物檢疫官，雙方就輸入活昆蟲之管制措施進行意見交換（圖二十九）。

下午前往位於神奈川縣大和市之大和隔離檢疫苗圃，拜會橫濱植物防疫所業務部種苗担当村井覺次席植物檢疫官，並參觀植物隔離檢疫設施。

11 月 1 日　上午前往位於成田機場之橫濱植物防疫所成田支所，拜會相馬伸俊次長及該所第一航空貨物担当阿部淳統括植物檢疫官，並參觀輸出入植物檢疫作業及設施。

下午拜會成田支所第 2 PTB 旅客担当直江康博統括植物檢疫官及堀川克己次席植物檢疫官，參觀入境旅客動植物檢疫業務並就違規裁罰作業進行意見交換。

11 月 2 日　搭乘 14：15 華航 CI 17 班機返國。

參、參訪見聞

本次行程除拜會橫濱植物防疫所，了解其同定制度與同定官之訓練、輸入植物與檢疫有害生物風險評估方式及相關實驗室、輸入活昆蟲之規定、大和隔離檢疫苗圃設施，並參觀橫濱植物防疫所成田支所貨物檢疫現場及入境旅客檢疫業務，就相關作業進行了解，相關參訪所見略述如下：

一、拜訪位於神奈川縣橫濱市中區橫濱第 2 合同廳舍之橫濱植物防疫所（圖一），拜會該所小野仁業務部長，並由調查研究部企画調整担当内山亙次席調查官、業務部貨物担当增山勇次席植物檢疫官及業務部輸出及國內檢疫担当豬平倫文次席植物檢疫官進行業務簡報及介紹（圖二）。

橫濱第 2 合同廳舍內計有法務省、財務省、厚生勞働省、農林水產省、國土交通省、防衛省、及獨立行政法人航海訓練所等多個單位合署辦公（圖三）。橫濱植物防疫所內之簡報室除簡報銀幕外，另展示各種防檢疫宣導海報（圖四）、各種自國外輸入農產品之樣本（圖五）、各式蟲害誘集裝置（圖六）、檢疫官制服及徽章（圖七）、重要有害生物資料與圖鑑（圖八）、各種檢疫用取樣及檢查工具（圖九）及國際重要檢疫有害生物之生態與分布地區及圖鑑（圖十）等參考資料，供參訪人員對防檢疫業務有概括性之認識。

日本的植物檢疫概念起源於明治天皇時期（西元 1852 年－1912 年），因蘋果棉蚜（Woolly apple aphid）及箭頭介殼蟲（Arrowhead scale）等有害生物藉由國外輸入之貨物侵入造成農業生產爲害後開始萌芽，並於 1914 年公佈植物檢疫法規（Plant Quarantine Law），針對有害生物之入侵、蔓延及撲滅進行管理，目前中央係由農林水產省消費安全局植物防疫課統籌相關防檢疫業務，人員計 40 人；而實際業務則另於全國設置橫濱、名古屋、神戶、門司及那霸 5 個植物防疫所（Plant Protection Station），植物防疫所轄下另設有 15 個支所與 48 個出張所及仙台空港、新千歲空港、廣島空港及小笠原 4 個植物檢疫辦公室負責執行業務（附件一）。

日本植物檢疫系統包括國際植物檢疫及國內植物檢疫兩部門，其分工如下：

（一）國際植物檢疫部門：分爲輸入植物檢疫及輸出植物檢疫兩部分，輸入植物檢疫主要負責業務爲輸入植物及其產品檢查、輸入隔離檢疫及海外產地檢疫；輸出植物檢疫主要負責輸出植物及其產品檢疫及輸出植物栽培地病蟲害檢查。

（二）國內植物檢疫部門：負責國內種子及種苗檢疫、特定病蟲害撲滅與控制計畫、新入侵有害生物警戒調查及有害生物緊急防除業務。

二、拜訪橫濱植物防疫所位於新山下廳舍之辦公室（圖十一），由有害生物診斷鑑定部門主管鶴田賢治（Kenji Tsuruta）博士針對同定制度進行簡介及說明。該廳舍計有檢查害蟲實驗棟及檢查實驗棟兩建築。

日本同定制度（鑑定制度）始於平成 8 年（西元 1996 年），目前共有 50 名同定官配置於全國 5 個植物防疫所、15 個支所及 2 個出張所內，其中包含害蟲担当 32 名、病菌担当 14 名及線蟲担当 4 名，本次拜會之橫濱植物防疫所內計配置害蟲担当 6 名、病菌担当 1 名及線蟲担当 1 名，另於轄區內之札幌支所配置病菌担当 1 名、塩釜支所配置害蟲担当 1 名、成田支所航空第 1 貨物担当配置害蟲担当 4 名與病菌担当 1 名、東京支所配置病菌担当 1 名與害蟲担当 1 名及新潟支所害蟲担当 1 名，總計 18 名。

同定官主要辦理業務內容簡述如下：

（一）病蟲害鑑定：輸入檢疫時發現之病蟲害鑑定、來自其他機關或一般民眾之病蟲害鑑定支援、港埠地區病蟲害項調查之鑑定支援及現存標本之再調查。

（二）鑑定識別資料製作：依國別及植物別製作鑑定指標、特定分類群之鑑定情報及各種研修用之資料製作（圖十二）。

（三）檢疫官鑑定技術研修：初任與中級及專門鑑定研修、鑑定識別講習會及專門知識與特殊技術研習。

（四）標本收集及管理：檢疫發現之害蟲標本收集（圖十三）與保存及病蟲害資料整理。

（五）相關文獻收集及整理：鑑定相關文獻收集與購置及整理。

日本同定官是選取具有鑑定興趣及潛力之植物防檢疫人員擔任，訓練採循序漸進之方式進行，每班次 20 人，先進行四週初級研習訓練，具 3 至 4 年經歷後再進行四週中級鑑定識別研習，而專門知識及特殊技術之研習則採一對一之研修方式進行。各地所發現之病蟲害先由配置於各單位之同定官進行鑑定，如無法鑑定時即送交植物防疫所之同定官進行鑑定，若仍無法鑑定時則送至學術單位委請專家學者協助鑑定，並給予一定金額當成謝金，各種檢疫發現之害蟲經作成標本後即保存於設定溫度 20℃及溼度 46%之

標本室中（圖十四），提供作爲訓練用之教材及鑑定之參考。對於各種病蟲害之鑑定技術、方法及圖鑑則編訂成冊並建置內部網站，供鑑定人員研習及鑑定之參考。

三、拜會調查研究部君島悅夫部長，並與該部消毒技術開發担当小畠恒夫統括調查官、病菌担当齊藤範彥統括調查官及害虫担当大戶謙二統括調查官進行會談並參觀燻蒸消毒實驗室（圖十五）。

該部所屬之燻蒸殺蟲實驗室採容積 6 公升及 30 公升之容器作爲試驗器材（圖十六），主要以溴化甲烷、氰酸、磷化鋁及碘化甲烷作爲試驗藥劑，並研究其他取代溴化甲烷之燻蒸藥劑。該實驗室另有養蟲室（圖十七）進行蒸熱殺蟲試驗，我國向日方提出之鮮果實殺蟲試驗之審查與評估即由此單位負責。病菌担当齊藤範彥統括調查官介紹病菌實驗室（圖十八）並說明我方關切其發生於東京地區之 Plum pox 疫情，據其表示 Plum pox 目前除東京地區有發生外，並未擴散至其他地區，並介紹日方所使用之檢測試劑套組，該試劑已商品化並可於 5 至 10 分鐘內進行結果判定（圖十九）。

病虫害危險度評価担当田中博道次席調查官簡介該國之風險評估機制（圖二十），渠表示橫濱植物防疫所新山下廳舍調查研究部配置 50 名研究人員，其中負責風險評估之人員有 9 人，其風險評估之方式係依據 ISPM NO.11（附件二）之程序進行，分爲一、啓動階段(Initiation)：針對病蟲害可能入侵之途徑、病蟲害之寄主種類及國外分布與發生情形進行調查；二、病蟲害風險評估(Pest Risk Assessment)：針對病蟲害入侵之可能性、入侵後立足之方式與速度及範圍、直接或間接對農業與環境及社會之衝擊，以及對整體經濟之影響進行評估；三、病蟲害風險管理(Pest Risk Management)：針對防範病蟲害入侵採取之措施選擇及輸入產品檢疫條件之建立。

風險評估之程序則先由農林水產省接獲申請案件後交由植物防疫所負責同仁進行評估作業，完成結論後另請專家提供意見，再將風險評估結果提送委員會確認後由農林水產省做最後決定應採取之措施。有關輸出國向日本提出該國禁止輸入之植物或植物產品解禁申請風險評估案件共分爲五個階段，分別爲：一、輸出國提出解禁申請。二、審查輸出國提出之試驗報告或基本資料。三、確認試驗數據及處理條件。四、輸出國提出現地試驗認證及確認認證結果。五、赴輸出國進行現地試驗認證及確認認證結果。前述作業完成後，復經舉行公聽會向相關產業說明後，再公告輸入檢疫條件，整個申請解禁程序即完成。

四、參訪位於東京笹塚車站旁之台灣物產館，並與藤田克己社長及朱亭錚主任就我國農產品輸銷日本相關問題進行意見交換。

台灣物產館（圖二十一）係由農業委員會經費支持，委由池榮青果株式會社代爲拓銷及展售我國生產之鮮果、乾果、茶葉、餅乾、酒類、飲料及其他農產加工品等農特產品（圖二十二至圖二十八），該館目前聘有 5 名工作人員，以可即時食用之產品最暢銷，年營業額約六千萬日幣。池榮青果株式會社屬池榮企業集團 5 個會社之一，該集團創設於日本昭和 22 年(西元 1947 年)，本社所在地位於東京都，主要營業地點分布於東京地區，目前擁有 65 家店鋪，經營項目包括蔬菜、鮮果、調味料、乳製品、畜產、農水產加工品、菓子、輸入食品、米穀、酒類及雜貨等，聘有 750 名員工，2010 年年銷售額達到 135 億日幣。

據藤田社長表示，目前台灣香蕉在日本因受低價且賣相好的菲律賓香蕉競爭，市占率已逐年降低，但其良好的口感仍受老一輩的日本人喜愛；而最近新開放之輸日之紅龍果則需與低價之越南火龍果競爭，未來如要打開日本市場仍需加強拓銷；至於番石榴則因果肉較硬且食用時尚須去籽，較不符合日本人吃水果時喜歡果肉軟及食用容易之習性；目前尚無法輸日之水果中印度棗果形漂亮口味佳，許多到過台灣之日本人皆極推崇，綠皮之檸檬比日本常見之黃皮檸檬品質佳，皆是未來可考慮輸日之品項。渠並表示冬季時日本消費者鍾情於草莓故消費量非常大，其他水果較難以取代，亦 是未來我國選擇開發輸日水果品項應納入考慮之因素。

五、拜訪位於橫濱合同廳舍之橫濱植物防疫所，拜會該所業務部種苗担当宮崎博次席植物檢疫官及種苗担当松尾敬一次席植物檢疫官，雙方就輸入活昆蟲之管制措施進行意見交換（圖二十九）。

日本對活昆蟲及微生物之輸入管制措施除須遵循國際之瀕臨絕種野生動植物國際貿易公約(Convention on International Trade in Endangered Species of Wild Fauna and Flora，簡稱 CITES)之規範外，需同時符合農林水產省公告之植物防疫法與家畜傳染病預防法及環境省公告之外來生物法之規定（附件三）。農林水產省及環境省公告可輸入之名單並不相同，故輸入前需同時取得兩機關之輸入許可證後始得辦理輸入。

農林水產省核准輸入之名單及相關規定可至農林水產省網頁查詢，申請輸入許可

之審查需 1 至 2 個月始可完成，如申請輸入之種類未屬可輸入之項目時，則須由橫濱植物防疫所調查研究部啓動風險評估機制進行評估，評估作業並無時間限制，該研究部目前有 5 名風險評估人員負責活昆蟲輸入之評估，另每年（一般在 3 月份）亦對可輸入之名單進行檢討修正。

目前每年約從東京成田空港進口約 11 萬隻活昆蟲，其中約有 8 萬隻鍬形蟲，主要來源地爲非洲及東南亞。雖然已開放部分活昆蟲可輸入日本，但仍有許多禁止輸入之種類經由非法管道進入日本，雖然有海關及警察人員配合進行市面查緝，惟該國法律僅能對輸入者進行處罰，並無對販售者處罰之法規，故目前日本對非法輸入活昆蟲之防範措施僅能於輸入港埠加強查緝，並對輸入業者加強宣導與道德勸說，另鼓勵業者將欲輸入之活昆蟲資料送交農林水產省查詢是否可輸入，以免危害國內生態安全。

六、拜訪位於神奈川縣大和市之大和隔離檢疫苗圃，拜會橫濱植物防疫所業務部種苗担当村井覺次席植物檢疫官（圖三十），並參觀植物隔離檢疫設施。

日本目前有 5 個輸入種苗之官方隔離苗圃，分別位於北海道、神奈川縣、愛知縣、兵庫縣及沖繩縣，輸入應施隔離之種苗時，業者可指定隔離地點，如業者指定之隔離場容量不足時，亦可將部分種苗移至其他隔離苗圃；輸入隔離檢疫期間並不向輸入業者收取任何費用。

輸入日本應施隔離之種苗種類係規範於植物防疫法施行細則第 14 條（附件四），主要爲花卉球莖、馬鈴薯與蕃薯種薯、果樹之母株與接穗及甘蔗與鳳梨之種苗，隔離期間一般爲一個生長季或一年。日本對於荷蘭、智利及紐西蘭三個主要花卉球莖生產國另訂有花卉球莖輸日之檢疫條件，由日本派員至該國執行產地檢疫合格後，花卉球莖輸入時即無須再經隔離，故目前輸入隔離之種類主要爲果樹種苗及自前述三個國家以外地區所輸入之少量花卉球莖。另輸入業者亦可申請設置私人隔離苗圃，經農林水產省審查設施、檢測設備及檢測能力通過後即可辦理輸入種苗隔離作業，後續再由農林水產省進行不定期抽查。

大和隔離檢疫苗圃（圖三十一）面積計 18,836 平方公尺，於 1948 年開始設置，目前建置 3 座溫室及 7 座網室隔離苗圃（圖三十二至圖三十六），另有管理棟、檢定棟、土壤殺菌室、隔離物件保管室及堆肥舍 5 棟建築，配置正式員工 7 名，臨時工 4 名，檢疫方式係依規定對所有輸入樣品皆進行檢查，依種類採取目視、電子顯微鏡、指示

植物接種法、酵素結合免疫吸附法(ELISA)及聚合酶鏈鎖反應(PCR) 等方法進行檢查，所有栽培盆及栽培介質皆經 120℃處理 2 小時之方式進行消毒後再使用（圖三十七）。

七、拜訪橫濱植物防疫所位於成田機場之成田支所，拜會相馬伸俊次長及該支所第一航空貨物担当阿部淳統括植物檢疫官（圖三十八），並參觀輸出入植物檢疫作業及設施。

成田機場目前配置 93 名檢疫人員，一半人員負責貨運業務，另一半人員則負責旅客業務，貨運業務採四班制，旅客部分則採三班制。輸入之植物或其產品主要爲切花、蔬菜、鮮果及苗木，約占輸入量之六成，全年檢疫批數約 7 至 8 萬批，該機場晚上 11 點至隔日凌晨 6 點並無班機起降，輸入貨物檢疫時間可配合加班至凌晨 2 點。

檢疫申請方式採網路連線電子申報或現場臨櫃申請，並設有銀幕顯示各申請案件之辦理進度，所有檢疫案件業者皆無須支付任何檢疫費用。檢查區域一樓依植物種類分別有切花、種子、穀類、蔬菜、球根及種苗檢查室（圖三十九及圖四十），位於二樓則另設有病蟲害鑑定實驗室。機場內另設有 2 座燻蒸設施，採委外方式運作。檢疫人員對裝載非屬應施檢疫項目之木質包裝材並不主動檢查，而是透過宣導告知業者相關國際規定。

八、拜會成田支所第 2 PTB 旅客担当直江康博統括植物檢疫官及堀川克己次席植物檢疫官，參觀入境旅客動植物檢疫業務並就違規裁罰作業進行意見交換。

成田機場第 2 航廈旅客檢疫櫃檯位於旅客行李轉盤旁，於行李轉盤前之牆面及檢疫櫃檯上置有電視螢幕播放檢疫規定宣導片，教育並提醒入境旅客相關應遵守之檢疫規定，另由檢疫人員手持入境應申報之動植物產品圖片於行李轉盤旁供旅客參考。機場並配置 2 組檢疫犬組，於周一至周五下午選擇風險較高之入境班機執行檢疫物之偵測，每天執行 3 小時之勤務，領犬員係對外招募非正式檢疫人員，檢疫犬組如查獲肉類則由隨行之檢疫官將旅客及其行李引導至檢疫櫃檯處理，如攜帶之產品不符檢疫規定者則予以沒入銷燬，沒入時一般並不開立處理通知書，僅於旅客要求時始開立沒入憑據。旅客如第一次蓄意夾帶檢疫物闖關被查獲時則予以登記並不處罰，如第二次再被查獲時即處以最高可達 50 萬日幣之行政處分，情節重大者再移請警察單位偵辦。

該機場配置之 2 組檢疫犬組目前僅具偵測肉類產品之能力，並未針對植物產品之偵測進行訓練，據檢疫人員表示現階段日方採取之策略，係認爲如旅客有攜帶肉類產品則相對攜帶植物產品之可能性亦高，故皆對該旅客之行李加強查驗。目前日本於成

田機場與關西機場及名古屋機場各配置 2 組檢疫犬組，未來亦將於羽田機場及福岡機場配置檢疫犬組，頃正派員赴美國接受訓練中。

肆、心得與建議

我國爲世界貿易組織成員國之一員，所有貿易規範應依其宗旨施行，世界貿易組織之宗旨係在促使所有成員提高貿易政策和措施之透明度，履行所作出之承諾並確實遵守世界貿易組織規則，從而有助於多邊貿易體制平穩運行，故本局所訂之輸入植物檢疫規範及相關作業，除須遵循世界貿易組織之食品安全檢驗與動植物防疫檢疫措施協定外，亦須符合其基本原則即非歧視性原則（最惠國待遇原則及國民待遇原則）、透明度原則、自由貿易原則及公平競爭原則。我國之植物檢疫制度已行之多年，除參考各先進國家之制度外，亦配合國際貿易型態之變化及趨勢適時予以調整，鑑於日本植物檢疫制度發展較我國早，相關配合措施亦趨完整，本次參訪之橫濱植物防疫所本所位於東京地區，轄區內包括國際機場與海港及隔離苗圃，並另有實驗研究大樓，其實務運作及累積之經驗頗值得我國參考與學習。

日本橫濱植物防疫所內之簡報室除有簡報銀幕可進行業務簡報外，另亦提供各種執行植物檢疫業務之相關參考資料作實體展示。本局各分局鑑於辦公廳舍空間之限制，無法規劃完整之實體展示場所，惟爲擴大宣導效果，建議各分局可選取適當位置設置如上述參考資料，另可加入分局成立沿革及歷年檢疫成果，除可提供參訪人員對防檢疫業務概括性之認識外，亦可顯現本局之工作績效，兼具教育及宣導之意義。

日本同定官係選取具有鑑定興趣及潛力之植物防檢疫人員擔任，訓練方式除採循序漸進經初級研習及中級鑑定識別研習之方式進行外，亦針對專門知識及特殊技術採一對一之研修方式進行。而各植物防疫所之同定官除有各類有害生物專屬研究實驗室使用外，亦配置部分同定官於各輸出入港埠協助有害生物之鑑定。相較於日本之同定制度，本局因員額及經費之限制並無專屬之有害生物鑑定人員及研究實驗室，檢疫人員並無法專職於鑑定工作，除對少數常見之有害生物具有鑑定能力外，大多數需鑑定之案件皆須委請學術研究單位協助辦理，於鑑定時效上往往曠日費時，影響貨品通關，未來如能參照日本建立同定制度，將可有效解決前述問題並提昇檢疫人員之專業權威性。

有關有害生物風險評估方式，日本亦依據 ISPM NO.11 建議之啓動階段、病蟲害風險評估及病蟲害風險管理三階段進行。於接獲申請案件後交由橫濱植物防疫所負責同仁進行評

估作業，完成結論後另請專家提供意見，再將風險評估結果提送委員會確認後由農林水產省做最後決定應採取之措施。我國之風險評估方式亦遵循 ISPM NO.11 之規範進行，惟本局並無專責之風險評估人員，針對國外申請輸銷之案件係於接獲後先進行內部初審，初審結果如需補充資料則通知申請國補充資料，後續再送請外部專家進行評估，完成結論後再將風險評估結果提送植物檢疫諮議委員會（Plant Quarantine Advisory Committee）檢疫小組審議，如經審議通過必要時則派員赴國外進行實地查證，實地查證結果再提報植物檢疫諮議委員會確認，通過後再進行後續訂定檢疫條件之法制作業程序。

設於日本東京笹塚地區之台灣物產館係由農業委員會委託日本池榮青果株式會社負責營運，於 95 年 7 月 25 日開幕，店內面積約 105 平方公尺，代爲拓銷及展售我國生產之鮮果、乾果、茶葉、餅乾、酒類、飲料及其他農產加工品等農特產品，除做爲台灣農產品的展示及銷售櫥窗外，亦可作爲日本批發商就近看貨下單的交易與貿易諮詢及辦理宣傳促銷之平台。日本農產品仰賴進口之比例頗高，除了與我長期友好，同時更有交通運輸近之便利性，爲我國農產品輸銷之最重要國際市場。因此未來可透過台灣物產館拓展分店據點之方式，連結成大範圍的日本外銷通路網。

日本對活昆蟲及微生物之輸入管制措施除須遵循國際之瀕臨絕種野生動植物國際貿易公約之規範外，需同時符合農林水產省公告之植物防疫法與家畜傳染病預防法及環境省公告之外來生物法之規定。我國對活甲蟲及微生物之輸入管制係由本局依植物防疫檢疫法規定施行，一般申請輸入之產品，除須考量其是否爲植物防疫檢疫法規範之植物有害生物外，尚需請其他相關單位如林務局、特有生物保育中心及其他學術研究單位提供輸入後是否對本土生態物種造成衝擊之意見後，始決定是否同意進口；如以學術研究之用途申請輸入，則另依植物防疫法施行細則之規定辦理專案核准並進行輸入後之隔離管制。對於非法輸入產品之查緝方式，則於輸入港埠及國際郵包中心加強檢查攔截，並配合關稅總局及海巡署於海岸地區之走私查緝；對已輸入國內之非法產品則透過主動收集資訊及民眾檢舉，移由關稅總局市面查緝小組協助查緝；另針對網路販賣非法輸入之產品，則於收集相關資訊及

證據後，移交警政署刑事警察局偵九隊負責偵辦。所有前述案件皆透過司法程序移由檢調單位偵辦，以遏止不法。

有關輸入種苗隔離制度，日本目前除有官方隔離苗圃外，亦有經植物防疫所審查核可具有檢測設備及技術之私人隔離場，業者輸入需隔離之植物產品時則可指定隔離地點。日本對荷蘭、智利及紐西蘭三個主要花卉球莖生產國訂有花卉球莖輸日之檢疫條件，輸入花卉球莖依雙方議定之檢疫條件辦理，輸入時即無須再經隔離檢疫，有效紓解隔離場之作業負擔。我國未來將把自行隔離場所由檢疫人員負檢疫之輸入植物隔離檢疫業務，全部回歸至動植物檢疫中心辦理，因目前主要輸入隔離之植物種類爲櫻花苗及玫瑰苗，似可參考日本之作法並採取輸入梨接穗之模式訂定輸入檢疫條件，以派員赴產地進行生產地及母株有害生物檢測及輸出檢疫之方式取代輸入隔離檢疫；另因應私人申請自行隔離場之方式，應賦予其需具備有檢測設備及技術之能力，檢疫單位再進行定期及不定期之抽查。

橫濱植物防疫所位於成田機場之成田支所其業務執行之方式，係因應機場作業時間排定檢疫人員值勤方式，而我國桃園國際機場因係 24 小時作業，檢疫業務相對負擔較重，成田機場檢疫區域則依植物產品種類分別設有切花、種子、穀類、蔬菜、球根及種苗檢查室，備有不同檢查設備以便利檢疫人員執行檢疫作業，而我國現有機場檢查區域則未有分區之檢查室，未來可向各航空站爭取設立；申報作業則兩國皆採納電子申報及臨櫃申報方式，亦透過網路連線方式以電子訊息進行發證，減少紙張之使用，唯一不同之處是日本針對檢疫案件並不收取規費。

日本對入境旅客攜帶動植物及其產品之檢疫，亦與我國相同採取宣導及檢疫取偵測之方式進行，該國目前僅有 6 組檢疫犬組，領犬員同樣是委外辦理，非由檢疫人員擔任，受限於檢疫犬組數量之限制，檢疫犬值勤之時間亦僅選取部份時段進行，且檢疫犬組僅能偵測肉類產品，並未針對植物產品之偵測進行訓練。而我國之檢疫犬組已達 40 組，除值勤之時間可較長外，同時亦可涵蓋較多之入境船機，更在國際郵包中心配置檢疫犬組，另所有

檢疫犬皆可偵測多種動植物產品，偵測之正確率亦符合美國、澳大利亞及紐西蘭等先進國家之檢疫犬偵測正確率，對防範國外有害生物隨輸入貨品之入侵有極大助益。

此次參訪作業除感謝日本農林水產省之安排及日本交流協會台北事務所之協助，使本次行程得以順利完成外，並承我駐日代表處林榮貴一等秘書居中聯繫與陪同，使此行得以順利圓滿，併致謝忱。

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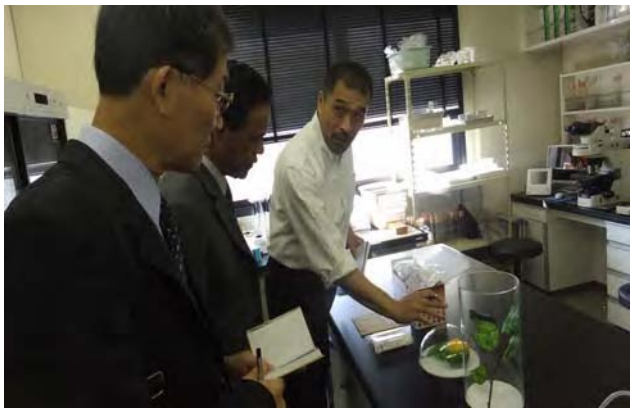

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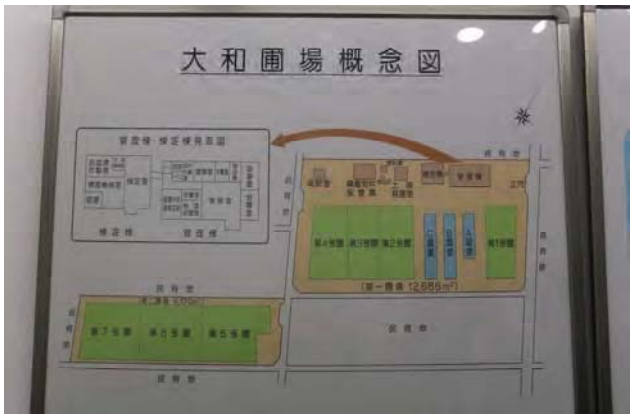

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陸、附件

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本パンフレットは平成20年3月現在の情報を基に作成されています。
最新の情報については、最寄りの植物防疫所、または植物防疫所ホームページ(http://www.maff.go.jp/pps/)でご確認ください。

This pamphlet was prepared based on information as of March 2008.
For the latest information, please contact your nearest Plant Protection Station or visit the Plant Protection Station website (http://www.maff.go.jp/pps/).

2008

附件二、日本植物檢疫業務簡介

農業と緑を守るために

農林水産省 植物防疫所の仕事

Protecting Japanese Agriculture and Forests

Functions of Plant Protection Stations | Ministry of Agriculture, Forestry and Fisheries

農林水産省 MAFF

植物防疫所は病害虫の被害から日本の農業と緑を守っています。

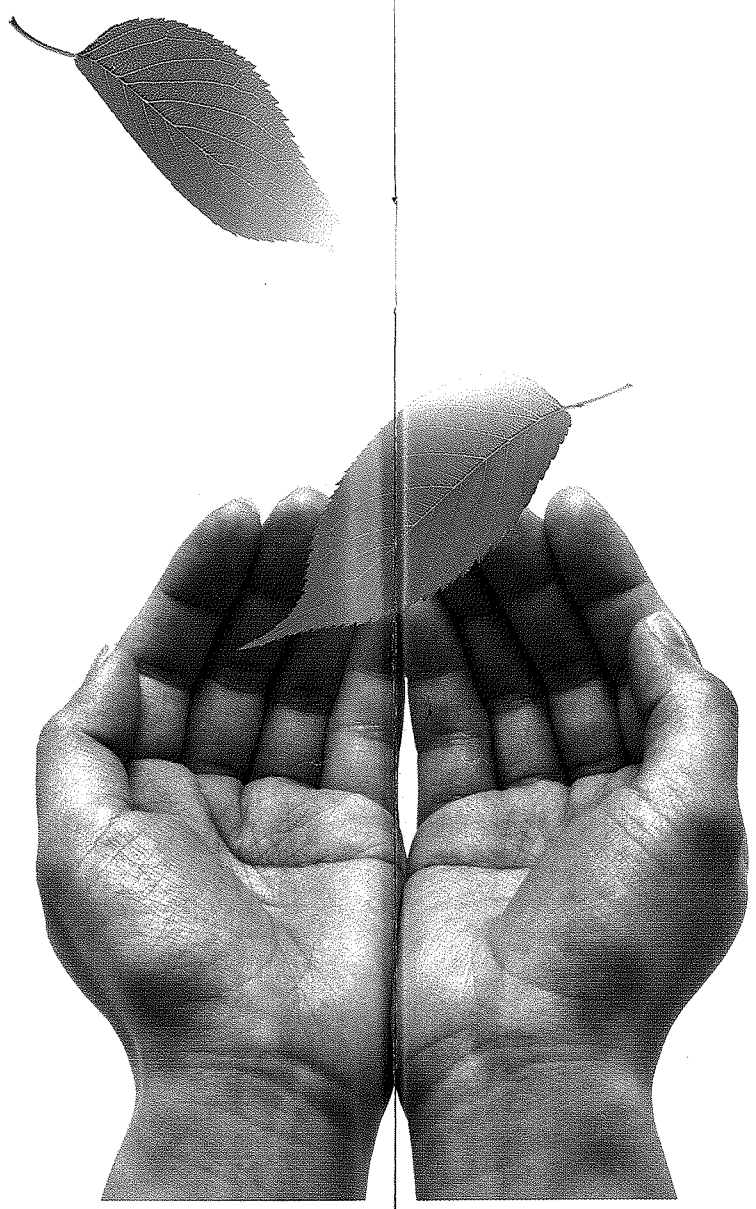
Plant Protection Stations protect Japan's agriculture and forests from harmful insects and diseases.

植物の病害虫が新たな地域に侵入すると、思いもよらぬ大きな被害を与えることがあります。ヨーロッパで猛威を振るい植物検疫開始のきっかけとなったブドウネアブラムシ、北米大陸への移民の原因となったといわれるアイルランドのジャガイモ疫病、日本からアメリカに渡り大害虫となったマメコガネなどその例は数え切れないほどで、一度侵入した病害虫の根絶が難しいことも歴史が物語っています。

日本は四方を海に囲まれているため病害虫が自ら侵入してくることは多くはありませんが、明治以後リンゴワタムシ、ヤノネカイガラムシなどの病害虫が海外からの貨物に紛れて侵入し、日本の農作物に大きな被害をもたらしたため、大正３(1914)年に植物検疫が開始されました。

国際貿易が活発になり、コンテナーによる海上物流や航空輸送網、低温での流通管理技術の発達により日本に輸入される植物類の種類や数量は大幅に増加し、それに伴って病害虫が侵入してくる危険性は、従来にも増して大きくなってきています。

植物防疫所は、日本の植物に被害をもたらす海外からの病害虫の侵入を防ぐため、全国の港や空港で輸入検疫を行っているほか、特殊な病害虫の国内でのまん延を防ぐための国内検疫、諸外国の要求に応じた輸出検疫などの業務を行い、日本の農業と緑を守るために力を注いでいます。



When plant pests and diseases (hereinafter "pests") infiltrate into a virgin area, they often cause unimaginably disastrous losses to crops and other agricultural resources. Examples of such infiltrations are innumerable. They include grape phylloxera in Europe, which spread to such a great degree that it triggered the enactment of plant quarantine; potato blight in Ireland, which is believed to have sparked emigration to North America; and the Japanese beetle in the United States, which was brought from Japan and emerged as a devastating pest. Moreover, history has shown that once a pest infiltrates an area, its evadication is difficult.

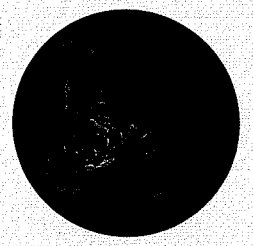
Because Japan is surrounded by the sea, few pests actually invade Japan on their own. However, beginning in the Meiji period, pests including the woolly apple aphid and arrowhead scale slipped into Japan via cargo from overseas. As such pests seriously threatened agricultural production in Japan, the Plant Quarantine Law was promulgated in 1914.

Today, international trade is becoming increasingly active. And container-based marine distribution systems and air-transport networks as well as technologies for cold-temperature transport are becoming more developed. The development has enabled more varieties and quantities of crops to be imported into Japan, creating greater risk that pests may enter Japan.

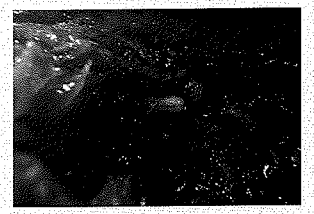
Plant Protection Stations function to protect Japan's agriculture and plants. They prevent the infiltration of overseas pests that damage Japanese crops by conducting import quarantine at seaports and airports throughout Japan. They also implement domestic quarantine to prevent the proliferation of specially designated pests within Japan as well as export quarantine in response to requests from other countries.

侵入を警戒する主な病害虫

チチュウカイミバエ



生果実の大害虫。成虫は果実に産卵し、幼虫は果肉を食べる。
分布地域：アフリカ、南アメリカ、ヨーロッパ、オーストラリア、ハワイなど
体長：4.5～5.5㎜

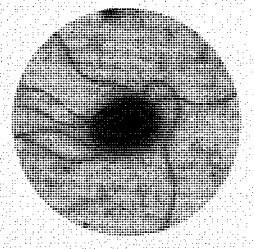


▲ミバエ類によるサウジアラビア産アンズの被害
Fruit-fly caused damage to Saudi Arabian apricots

Mediterranean fruit fly
(Ceratitis capitata)

Pest that causes major damage to fruit. Adults lay their eggs on fruit; larvae eat fruit flesh.
Distribution: Africa, South America, Europe, Australia, Hawaii, etc.
Length: 4.5 to 5.5 mm

火傷病



リンゴ、ナシなどの果樹やサンザシ、ピラカンサなどの花木類に被害が著しい細菌による病気。本病による症状は火傷(やけど)にあったような外観を呈し、樹全体が枯れる。
分布地域：北アメリカ、ヨーロッパ、西アジア、ニュージーランドなど

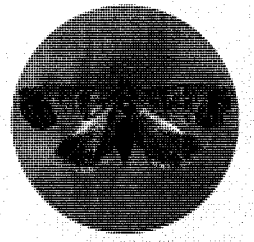
▲火傷病に侵された被害樹
A tree damaged by fire blight

Fire blight
(Erwinia amylovora)

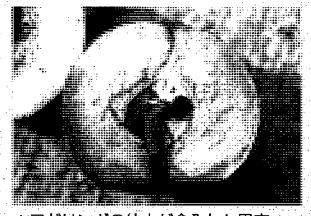
A bacterial disease that causes severe damage to fruit trees, such as apple and pear, as well as firethorn, pyracantha and other flowering trees. Outward symptoms resemble burns. The disease leads to withering of the entire plant.
Distribution: North America, Europe, western Asia, New Zealand, etc.

Major pests requiring precaution

コドリンガ



リンゴ、モモ、クルミなどの大害虫。成虫は未熟果や葉面に産卵、幼虫は果実の内部を食害する。
分布地域：温帯全域
開長：18～22㎜

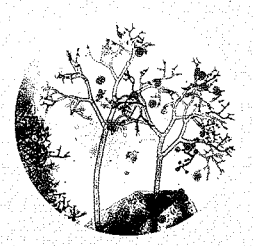


▲コドリンガの幼虫が食入した果実
Fruit that has been eaten into by a codling moth larva

Codling moth
(Cydia pomonella)

A pest that causes significant damage to apples, peaches, walnuts, and other crops. Adults lay their eggs on immature fruit or leaves; larvae eat into fruit flesh.
Distribution: Temperate zones
Wingspread: 18 to 22 mm

タバコベと病



ナス科の植物、特にタバコ、トマト、トウガラシなどに大きな被害を与える病気。この病気にかかると、葉が変形してしまい、育たなくなり、ひどくなると枯死する。
分布地域：ヨーロッパ、南北アメリカ、オーストラリアなど

▲タバコベと病を発病したタバコ
Tobacco plants being attacked by Tobacco blue mold

Tobacco blue mold
(Peronospora tabacina)

A disease that greatly damages plants of the Solanaceae family, especially tobacco, tomatoes, and chili pepper. Plants affected by Tobacco blue mold have deformed leaves and stop growing. In serious cases, the plant dies.
Distribution: Europe, North and South America, Australia, etc.

植物検疫は日本全国において病害虫の侵入・まん延を防いでいます。

Plant quarantine stops the infiltration and spread of pests in all areas of Japan.

植物防疫所では、植物の病害虫が海外から侵入することを防ぐための「輸入検疫」、諸外国の要求に対応する「輸出検疫」、そして国内の病害虫対策を講ずる「国内検疫」と国の内外に向けて検疫を行っています。これらの検疫を実施するために、植物防疫所には専門的な資格を有する植物防疫官が配置されています。

Plant Protection Stations implement quarantine that target both domestic and overseas products. Such quarantine includes "import quarantine" to prevent the infiltration of overseas plant pests, "export quarantine" in response to requests from other countries, and "domestic quarantine" to control pests in Japan. Quarantine officials possessing expert qualifications are assigned to Plant Protection Stations to implement the above quarantine.

[植物検疫の仕組み Plant quarantine system]

植物検疫 Plant quarantine

国際植物検疫 International plant quarantine

輸入検疫 Import quarantine

- 輸入植物の検査 Imported plant inspection
- 隔離検疫 Post-entry quarantine
- 海外検疫 Pre-shipment quarantine in originating country

輸出検疫 Export quarantine

- 輸出植物の検査 Export plant inspection
- 輸出植物栽培地検査 Field inspection of export plants

国内植物検疫 Domestic plant quarantine

- 国内の種苗検疫 Quarantine of domestic seeds and seedlings
- 特殊病害虫対策 Eradication/control programs for designated pests
- 侵入警戒調査 Monitoring survey for newly invasive pests
- 緊急防除 Emergency action

■植物検疫は植物防疫法や国際植物防疫条約に基づいて、厳格に行われています。
Plant quarantine is strictly implemented in accordance with the Plant Quarantine Law and the International Plant Protection Convention.

海外からの病害虫の侵入を防ぐために

Protecting Japan from Pests Entering from Overseas

Import quarantine

海外からの病害虫の侵入を防ぐために輸入検疫を行っています。

Plant Protection Stations implement import quarantine to keep overseas pests out of Japan.

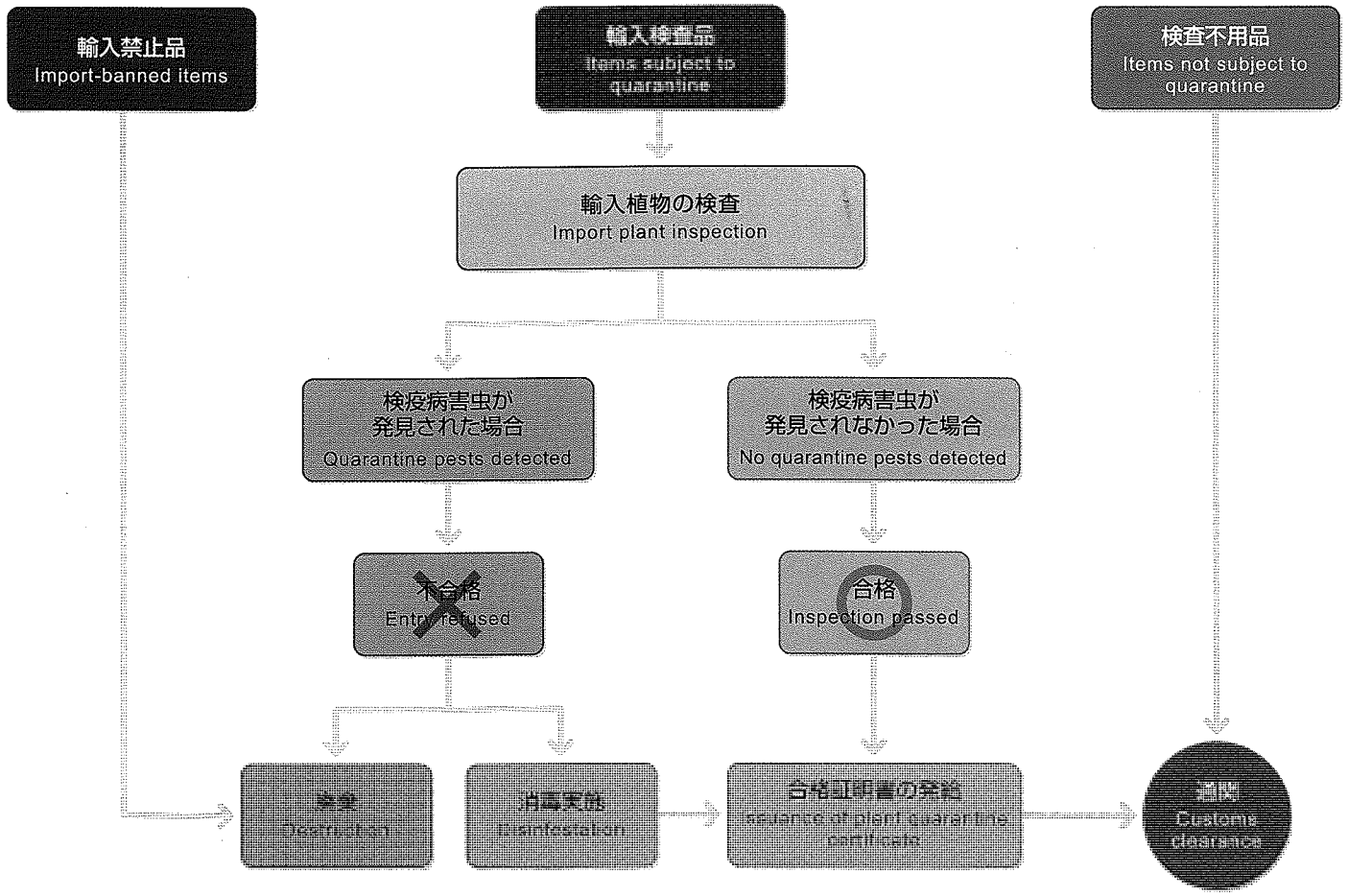
植物の病害虫が海外から輸入される植物に付着して日本に侵入することを防ぐため、輸入検疫が行われています。量や商用・個人用を問わず、貨物、携帯品、郵便物で輸入されるすべての植物が対象となります。

病害虫が付着する危険性のある植物とその病害虫の発生国により規制の内容を定め、病害虫の侵入を防止しています。植物は「輸入禁止品」「輸入検査品」「検査不要品」の３つに区分けされます。

Import quarantine is conducted to prevent plant pests from becoming attached to plants imported from overseas and then infiltrating Japan. All imported plants -whether they are cargo, carried in, or mailed- are subject to quarantine regardless of quantity or purpose (i.e., commercial or private use).

Infiltration of pests is prevented by establishing regulations for plants on which pests may exist and for countries of pest origin. Plants are classified into three types: "import-banned items," "items subject to quarantine," and "items not subject to quarantine."

[輸入検疫の流れ　Import quarantine procedure]



[植物の区分け　Plant classification]

●輸入禁止品

万一侵入した場合、大きな被害が予測され、かつ輸入時には的確な検査が困難な病害虫があります。このような病害虫が発生している国（地域）からの、その病害虫の付着するおそれのある植物は輸入が禁止されています。また、生きている病害虫や土なども輸入禁止品です。

●輸入検査品

輸入禁止品に該当しない植物で、苗木・観賞用植物・切花・球根・種子・果実・野菜・こく類・豆類・木材・香辛料原料・漢方薬原料などは輸入時の検査が必要です。

●検査不要品

植物であっても木工品や製茶など高度に加工され、病害虫の付着するおそれのないものは、輸入時の検査は不要です。

Import-banned items

There are pests that could be expected to cause serious damage if they were to enter Japan and for which inspection is difficult at time of importation. Thus, importation of plants that may have such pests on them from countries (regions) in which the pests are found is prohibited. Also, live pests, soil etc. are import-banned items.

Items subject to quarantine

Plants that are not import-banned items and that are seedlings, ornamental plants, cut flowers, bulbs, seeds, fruit, vegetables, cereals, beans, lumber, spice crops ingredients for Chinese medicines, etc., must be inspected when they are imported.

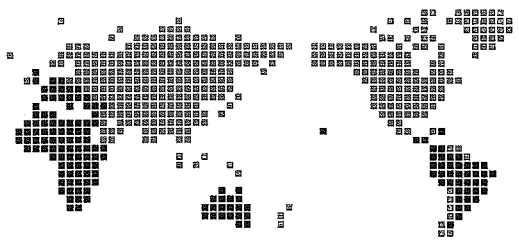
Items not subject to quarantine

Items that, although plant products, have undergone a high degree of processing (such as wood products and processed tea) do not require inspection when they are imported, as there is no possibility that pests exist on them.

[日本が侵入を警戒している代表的な病害虫の発生地域 Examples of regions that Japan watches for pest infiltration]

■ 発生地域 Region in which pest exists　■ 未発生地域 Region in which pest does not exist

チチュウカイミバエ Mediterranean fruit fly



●主な寄生植物 Main host plants

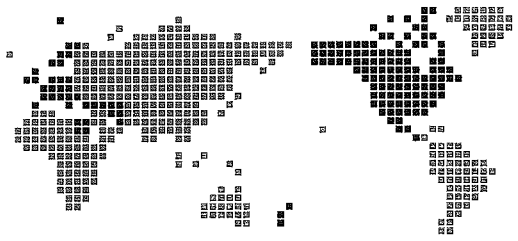

マンゴウ Mango


アボカド Avocado


キウイフルーツ Kiwifruit

※多くの果物類が輸入禁止です。 Many types of fruit are import-banned items.

火傷病 Fire blight



●主な寄生植物 Main host plants


西洋ナシ Pear


ビワ Loquat


ピラカンサ Pyracantha

全国各地で水際作戦が展開されています。

A waterfront strategy for the entire country

輸入検査は植物が輸入された場所で、通関に先立って行われます。

輸入される全ての植物について、必要量をサンプル抽出して実際に目で見て検査を行います。

Import quarantine is conducted prior to customs clearance at the place of entry.

All plants to be imported undergo visual inspection. Samples are also taken in necessary amounts.

●海港における貨物の検疫

こく類、青果物、木材などは大型専用船で、青果物、切花、球根、種子などはコンテナー船で輸入され、その港で検疫します。

Cargo inspection at seaports

Grain, fruits and vegetables, and lumber etc. are imported by bulk-cargo ships, while fruits and vegetables, cut flowers, bulbs, and seeds etc. are imported by container ships. All cargoes are inspected at the seaport of entry.

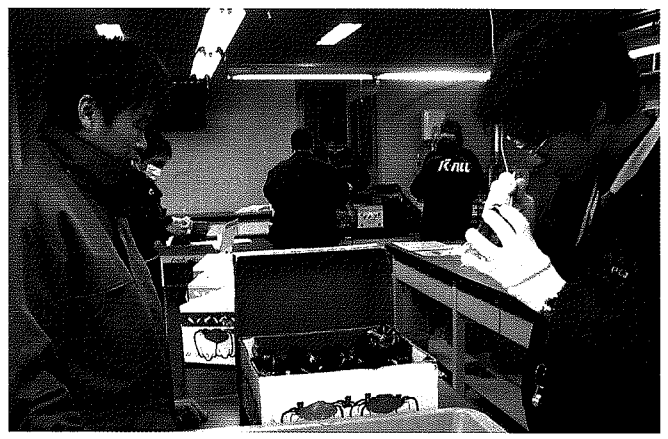
▲海港でのかぼちゃの輸入検査
Import inspection of pumpkins at a seaport

●空港における貨物の検疫

切花、球根、青果物などは航空貨物で輸入されます。また、本格輸入に先立つサンプル輸入として多種多様な小口貨物などもあり、到着した空港で検疫します。

Cargo inspection at airports

Cut flowers, bulbs, fruits and vegetables, and other items are imported by air cargo. All items are inspected at the airport of entry, and in some cases small-lot shipments are made as sample imports ahead of full-scale importation.



▲空港でのパプリカの輸入検査
Import inspection of paprika at an airport

●携帯品の検疫

入国する旅行客が携行して持ち込む植物は、到着ロビーの税関検査場内にある「植物検疫カウンター」で、税関検査に先立って検疫を行います。

Inspection of hand baggage

Plants that are brought in by passengers entering Japan are inspected prior to customs clearance at "plant quarantine counters" located within the customs inspection facilities of arrival lobbies.

▲旅客携帯品の輸入検査
Import inspection of a passenger's hand baggage

●郵便物の検疫

植物が含まれた郵便物は郵便事業株式会社の職員の立会いの下に事業所において検疫を実施した後、配達されます。

Inspection of postal items

Postal items that contain plants are delivered after they have been inspected at the post office in the presence of an employee of Japan post Service Co., Ltd.

▲海外から到着した郵便物の検査
Inspection of postal items from abroad

●種苗の検疫　Quarantine of seeds and seedlings

種子や苗木などは、さらに精密な検査を行います。

種子などは、輸入時の検査では発見できない病気に感染している可能性があります。この場合、サンプルを持ち帰り検定室でブロッター検査などの精密検査を実施します。

球根、果樹の苗木・穂木、いも類などウイルス病による大きな被害が警戒される植物については、他の植物から隔離された国のほ場などで一定期間実際に栽培する隔離検疫により精密な検査を実施します。

Seeds and seedlings undergo an even more thorough inspection.

Seeds can be infected with diseases that cannot be detected during import inspections. Consequently, when seeds and other such items are being imported, samples are taken to a laboratory, where they are subjected to blotter tests and other thorough inspections.

For bulbs, fruit tree seedlings and scions, plants of the potato family, and other plants for which there are concerns about major damage caused by viral diseases, thorough inspections are conducted through post-entry quarantine that involves actually cultivating plants for a certain period of time at national farms that are isolated from other crops.

▲輸入種子の精密検査
Thorough inspection of imported seeds

▲隔離検疫による苗木の精密検査
Thorough inspection by post-entry quarantine

日本の農作物を輸出するために

●海外検疫　Pre-shipment quarantine in originating countries

輸入禁止品でも条件付きで解禁されているものがあります。

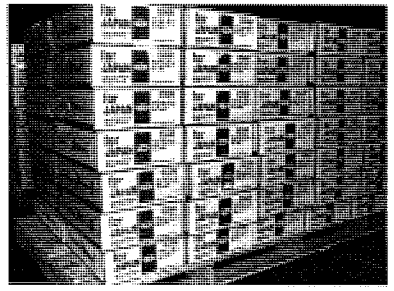
輸入禁止品であっても、相手国側において、発生している病害虫を完全に殺虫殺菌できる技術が確立し、その消毒措置が適正確実に行われる体制が整った場合には、農林水産大臣が一定の条件を付して輸入を解禁する制度があります。

輸入解禁を求める国と日本の政府間で、殺虫殺菌処理や病害虫の発生状況などに関する科学的なデータのやりとりがなされ、専門家による現地確認調査などを経て輸入が解禁されます。解禁された植物については、植物防疫官が輸出国に派遣され、輸出国政府が行う消毒や輸出検査など定められた条件が実際に守られているかを確認する海外検疫が行われます。

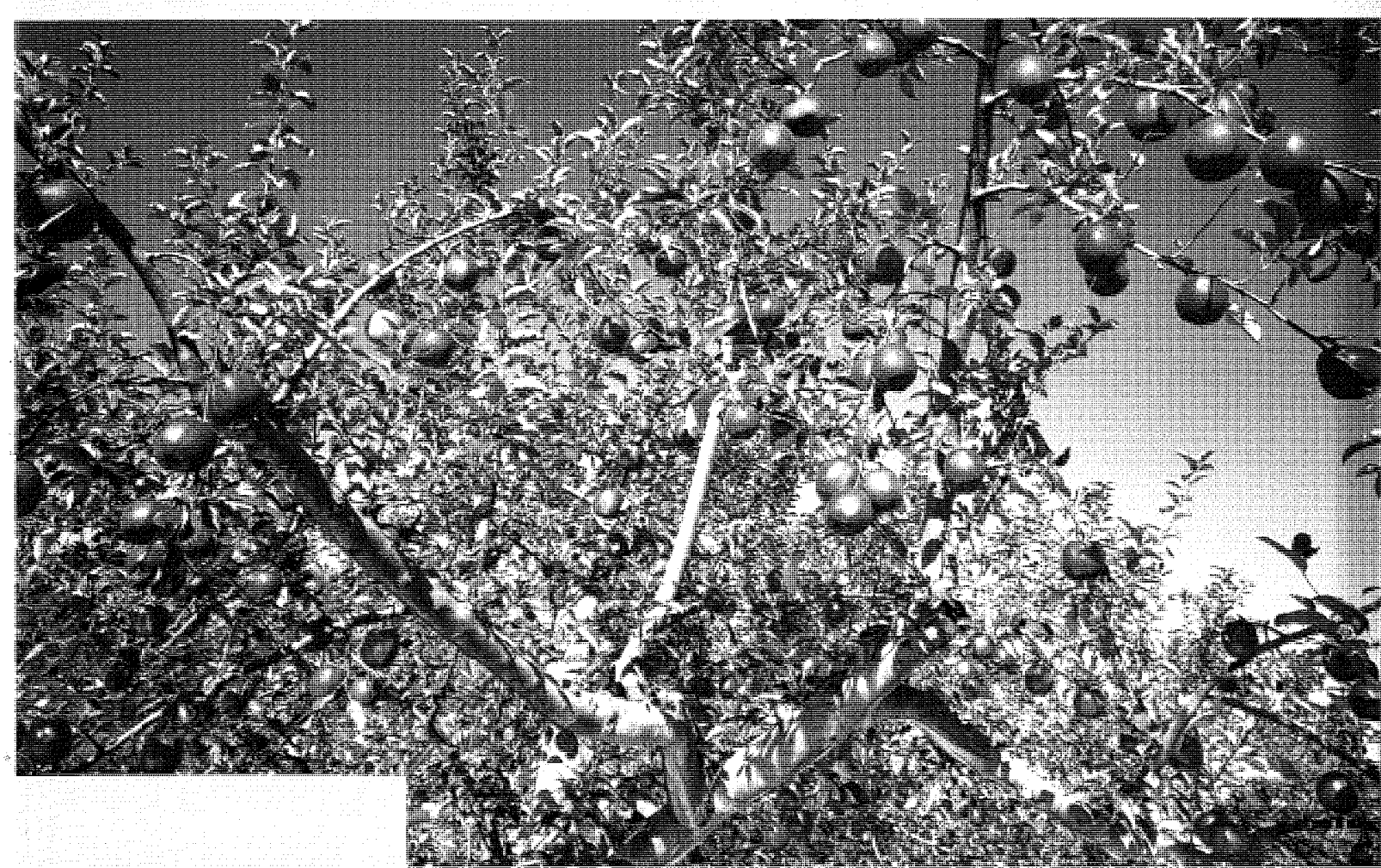
There are cases where even import-banned items can be imported with conditions.

The Minister of Agriculture, Forestry and Fisheries may allow the import of import-banned items with certain conditions if the originating country has technologies for sterilizing the items and a framework for using these technologies properly and reliably.

Import bans are lifted after the governments of the country requesting the lift and Japan exchange scientific data on sterilization measures and pest conditions, and experts conduct onsite inspections. A pre-shipment quarantine in the originating country is then conducted for plants whose ban has been lifted. This involves dispatching quarantine officials to the exporting country to confirm that the government of that country is actually abiding by set conditions (sterilization, export inspections, etc.).



◀条件付きで日本に輸出される植物
Plants for conditional export to Japan



[輸入解禁手続きの流れ　Process for lifting import bans]

輸出国政府
Government of country requesting lifting of import ban

日本政府
Japanese government

輸入解禁の要請●
Request for lifting of import ban
→ ●輸入解禁手続の開始
Beginning of procedure for lifting ban

試験・調査の計画の提出●
Submittal of plan for testing and inspection
→ ●専門家による確認
Confirmation by experts

試験・調査データの提出●
Submittal of testing and inspection data
→ ●専門家による評価
Evaluation by experts

現地確認試験・調査の計画の提出●
Submittal of plan for testing and inspection for local confirmation
→ ●専門家による確認
Confirmation by experts

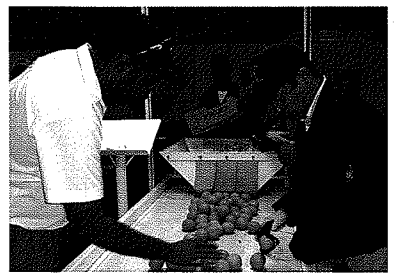
日本側専門家による現地確認試験・調査の実施
Testing and inspection for local confirmation by Japanese experts
2国間政府協議による輸出条件の策定
Determination of export conditions through meetings between the two governments
法令改正手続き（公聴会など）
Procedures for revision of relevant regulations (public hearings, etc.)
条件付き解禁
Conditional lifting of ban

消毒の実施・輸出検査●
Sterilization and export inspection
← ●植物防疫官の派遣
Dispatch of quarantine official

輸出　Export
→ ●輸入検査
Import inspection

輸入　Import

▲試験・調査データの作成
Preparation of testing and inspection data



▲輸出検査の現地確認
Local confirmation of export inspection

輸出相手国の要求に応じた検疫を行っています。

Implementing quarantine in response to requests from Japan's trading partners

日本から輸出される植物に輸出相手国が指定する病害虫の付着がないか、相手国の要求に即した消毒が実施されているかについて検査します。

●輸出時の検疫

植物防疫所は、日本の農産物を円滑に輸出するため、
①諸外国の植物検疫の規制情報の収集と情報提供、
②産地や市場などの集荷地での検査の実施、
③相手国が規制する病害虫に関する防除・選果指導
などの取り組みを行っています。

Quarantine when exporting

In order to facilitate smooth export of Japanese agricultural products, PPS provides necessary servises, such as 1) collection and extension of plant quarantine requirements of foreign countries, 2) on-site export inspection at consolidating areas, such as production areas and markets, and 3) technical training and lecturing on pest control, fruit sorting etc, for pests regulated by foreign countries.

▲輸出時のナガイモの検査
Export inspection of Chinese yams

Inspections are conducted to confirm that pests specified by Japan's export partners are not on plants exported from Japan and that sterilization is being implemented in accordance with demands by Japan's export partners.

●栽培中の検疫

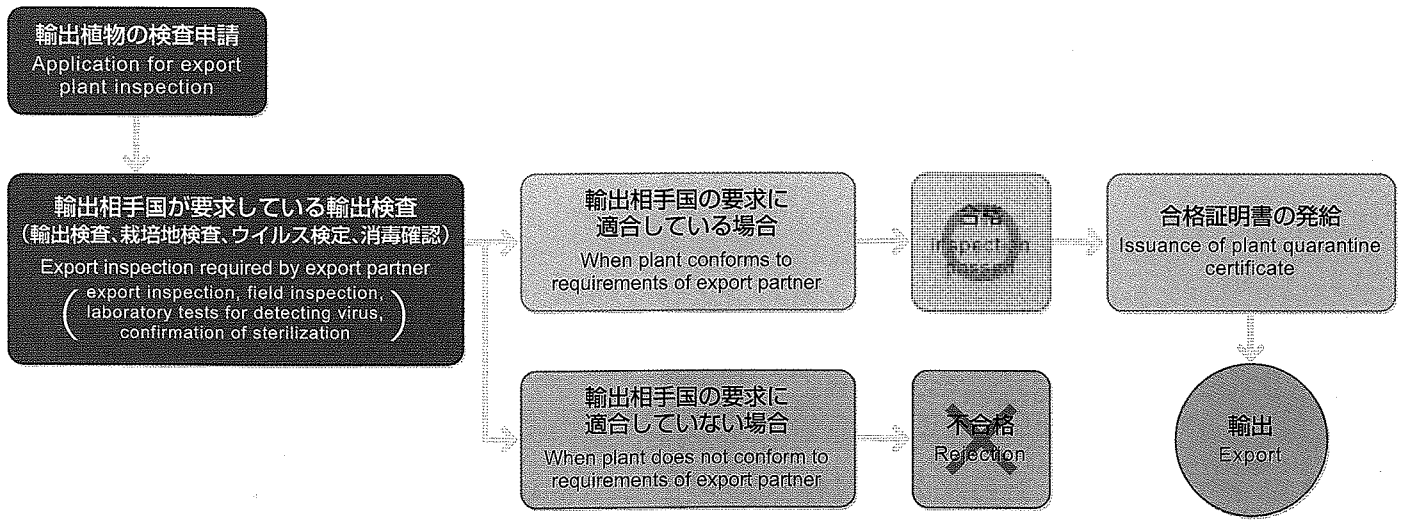
種子や苗木などは栽培中に病害虫が発生していないことを証明するよう要求される場合が多く、例えばＥＵ向けの盆栽などは輸出に先立ち２年間の栽培中の検査が求められています。

Quarantine during cultivation

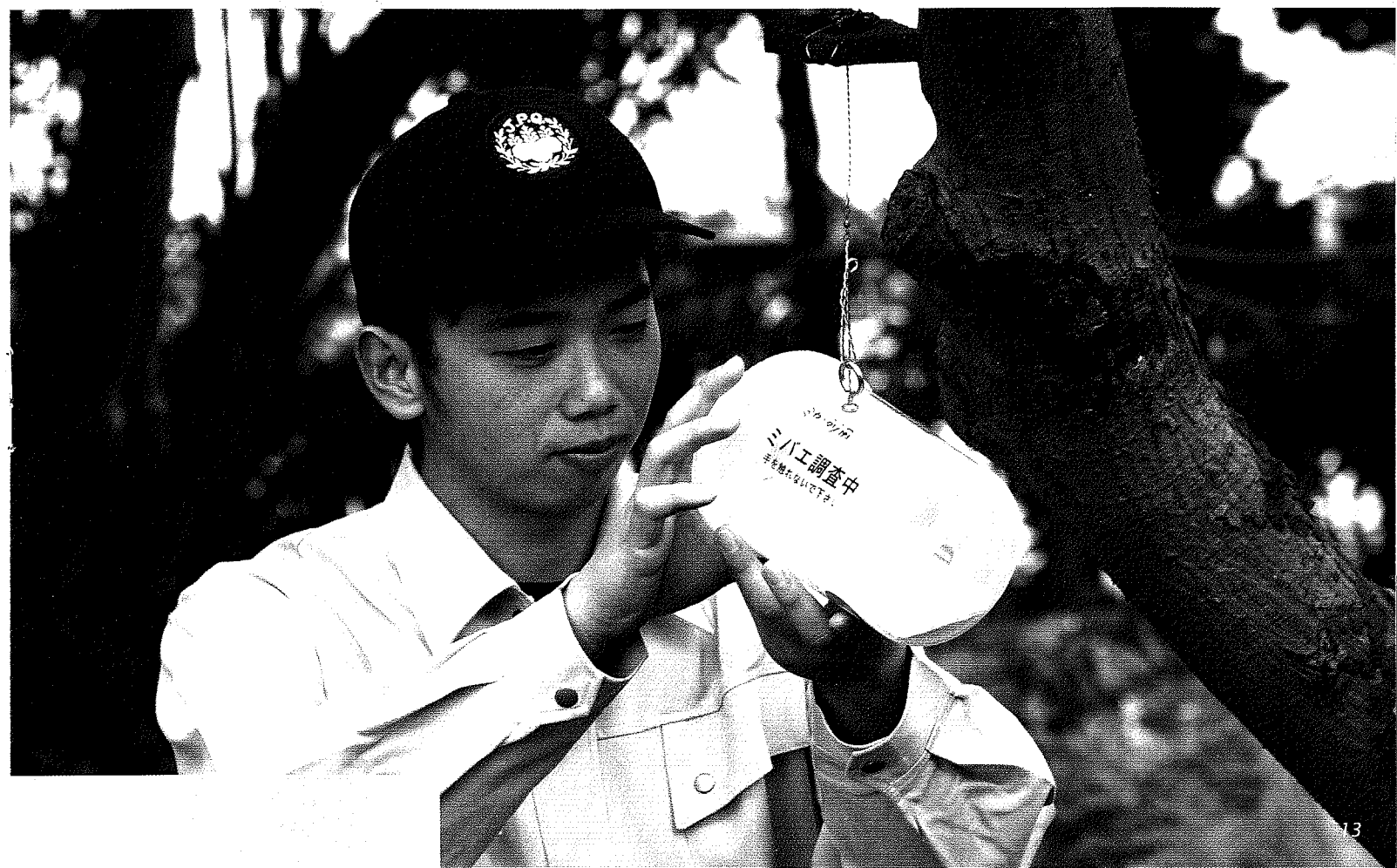
In many cases, Japan is reguested to certify that no pest infestation occurred during cultivation of seeds and seedlings. For example, the EU reguested that "Bonsai" for export to the EU be inspected during cultivation for two years prior to export.

▲栽培中の盆栽の検査
Inspection of "Bonsai" during cultivation

[輸出検疫の流れ　Export quarantine process]



国内で病害虫のまん延を防止するために



国内で病害虫のまん延を防ぐために、さまざまな対策を行っています。

Plant Protection Stations employs a variety of measures to prevent the spread of pests within Japan.

国内でもジャガイモや主要な果樹苗木の検査を行ったり、病害虫の発生地から未発生地への苗木類などの移動を規制して、病害虫のまん延を防いでいます。

Plant Protection Stations prevent the spread of pests within Japan by, among other activities, conducting inspections of seed potatoes and major fruit tree seedlings and regulating the movement of seedlings from regions with pest outbreaks to those without pests.

●国内の種苗検疫　Quarantine of domestic seeds and seedlings

病害虫の寄生していない種苗を供給するための検査を行っています。

健全な種苗を供給するために国が指定した種苗は、植物防疫官が毎年栽培中の適期に病害虫の検査を行い、この検査に合格しないと種苗として移動することができません。現在、ジャガイモが種苗として指定されており、植物防疫官が輪腐病、ウイルス病などの病害虫を対象とした検査を行っています。

また、かんきつ類、りんご、ぶどう、なし、もも、おうとう及びすももの繁殖用穂木を採取する樹（母樹）を対象にウイルス病などの検査を行っています。

Conducting inspections to ensure the supply of pest-free seeds and seedlings

In order to secure a supply pest-free seeds and seedlings, plant quarantine officials inspect nationally-designated seeds and seedlings for pests during their growth. Seeds and seedlings that do not pass this inspection cannot be supplied to end-users. Currently, seed potatoes are designated as seeds/seedlings requiring inspection, and quarantine officials inspect them for ring rot, viral diseases, and other pests.

Moreover, quarantine officials conduct inspections of trees (mother trees) from which scions are taken for propagation to determine the existence of viral diseases etc. Inspected plants include citrus, apple, grape, pear, peach, cherry, and plum.

▲種イモのほ場検査
Field inspection of seed potatoes

▲線虫の検出検査
Inspection for nematodes

●病害虫の根絶防除などの取り組み　Pest eradication programs

国内の一部に発生した病害虫から、日本の農業を守っています。

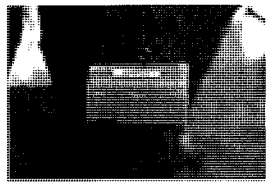
南西諸島（沖縄・奄美・トカラ）、小笠原諸島には国内の他の地域に発生していないアリモドキゾウムシ、アフリカマイマイなどの重要な病害虫が発生しています。植物防疫所は、これらの地域から対象病害虫及びこれらの病害虫が寄生する植物の未発生地域への移動を禁止するとともに、病害虫の根絶防除に取り組んでいます。

また、新しい病害虫が侵入した場合、早期に発見し、直ちに防除を行うことが重要です。このため、植物防疫所では全国の主要な海空港や通関手続きを行う郵便事業株式会社の事業所に誘引剤を入れたトラップを設置したり、都道府県の病害虫防除所などと連絡を密にして、常に侵入警戒調査を実施し、侵入病害虫の早期発見や緊急防除に努めています。

Protecting Japan's agriculture from regional pest outbreaks

On the Nansei Islands (Okinawa Islands, Amami Islands, and Tokara Islands) and the Ogasawara Islands, important pests - such as the sweet potato weevil and the giant African snail - exist that are not seen elsewhere in Japan. As they strive to eradicate pests, Plant Protection Stations also work to prevent the movement of these pests from their home regions as well as the movement of plants that host these pests to other regions.

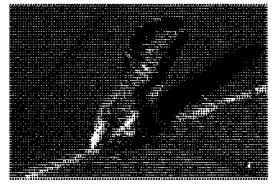
When new pests are introduced an area, it is vitally important to discover them at an early stage and to take immediate steps to eradicate them. Consequently, Plant Protection Stations have installed lure-bait traps at major sea / air ports of entry and Japan Post Service offices that conduct customs clearance procedures. They are also working closely with prefectural pest control stations to conduct continuous monitoring surveys, discover infiltrating pests at an early stage, and engage in emergency eradication.



▲侵入警戒トラップ
Monitoring trap

▲アフリカマイマイ
Giant African snail

▲アリモドキゾウムシ
Sweet potato weevil



▲ミカンキジラミ
Asian citrus psyllid

［移動が規制されている植物・病害虫とその地域　Plants/pests whose movement is regulated and their regions］

持ち出せないもの Items that cannot be taken out	病害虫の発生地域 Regions in which pest exist		持ち込めない地域 Regions into which items cannot be brought in
植物：ミカン科植物の一部の苗木類（ミカン・ポンカン・タンカン・シイクワシャーなどのかんきつ類、ゲッキツ・サルカケミカン・ワンピなど） Plants: Some seedlings of the Rutaceae family (citruses, Orange Jessamine, Toddalia asiatica, wampee, etc., including mandarin oranges, shaddock, Citrus tankan Hayata, and Citrus depressa Hayata) 病気：カンキツグリーニング病 Disease: Citrus greening disease 害虫：ミカンキジラミ Pest: Asian citrus psyllid	沖縄県全地域 All of Okinawa Prefecture	stop	沖縄県を除く国内全地域 All domestic regions except Okinawa Prefecture
	徳之島、沖永良部島および与論島 Tokunoshima Island, Okinoerabu Island and Yoron Island	stop	徳之島、沖永良部島及び与論島を除く国内全地域 All domestic regions except Tokunoshima Island, Okinoerabu Iskand and Yoron Island
	喜界島 Kikai Island	stop	喜界島を除く国内全地域 All domestic regions except Kikai Island
植物：さつまいも、ヨウサイ（エンサイ）、あさがお、ぐんばいひるがおなどの生茎葉及び地下部 Plants: Unprocessed stems and leaves as well as underground parts of sweet potato, water spinach (ensai), morning glory, and beach morning glory 害虫：アリモドキゾウムシ、イモゾウムシ、サツマイモノメイガ、アフリカマイマイ Pests: Sweet potato weevil, West Indian sweet potato weevil, sweet potato stem borer, and Giant African snail	沖縄県全地域、奄美群島、トカラ列島および小笠原諸島 All of Okinawa Prefecture, Amami Islands, Tokara Islands and Ogasawara Islands	stop	沖縄県全地域、奄美群島、トカラ列島および小笠原諸島を除く国内全地域 All domestic regions except Okinawa Prefecture, Amami Islands, Tokara Islands and Ogasawara Islands.

高い同定診断技術が検査を支えています。

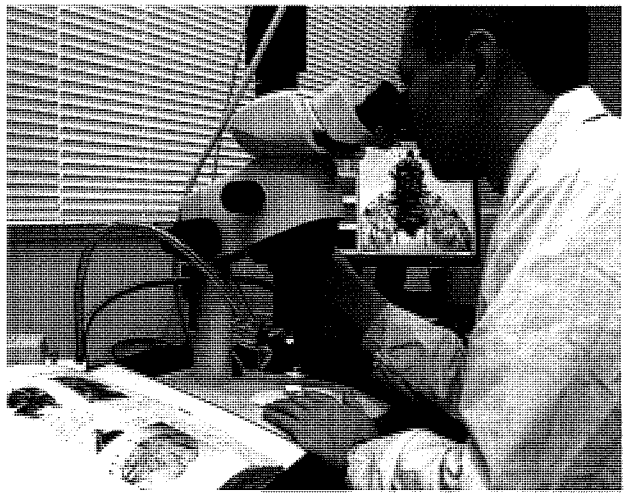
Sophisticated identification and diagnostic technologies support inspections.

病害虫は世界中に非常に多くの種類が存在しています。

検査で発見された病害虫の種類を正確に見分けること(同定)は、植物検疫にとって極めて重要な業務です。

検査現場で識別ができない病害虫は、全国ネットワークによって迅速かつ的確に同定され、それに基づき適正な検疫措置が講じられています。

また、検疫等で発見された国内外の病害虫の標本を保管管理したり、植物防疫官が病害虫を同定するための資料を作成し、これらを利用した研修を行い、同定技術の向上を図っています。



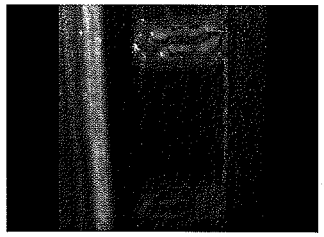
▲害虫の同定
Pest identification

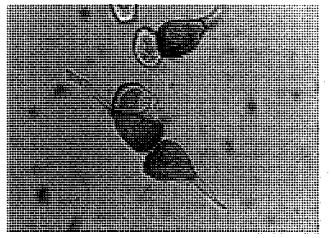
There is an extremely broad range of pests existing in the world.

And therefore the work of accurately classifying (identifying) the types of pests discovered in inspections is a vital part of plant quarantine.

When it is impossible to distinguish pests at inspection sites, a national network is used to quickly and accurately identify the pests, and then appropriate quarantine measures are implemented based on this identification.

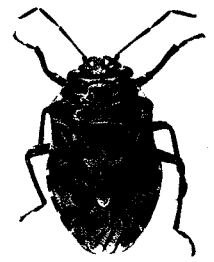
Plant Protection Stations store and manage samples of both domestic and overseas pests that are discovered in quarantine. They also prepare materials for identification by pests quarantine officials, conduct training using these materials, and work to improve identification skills.





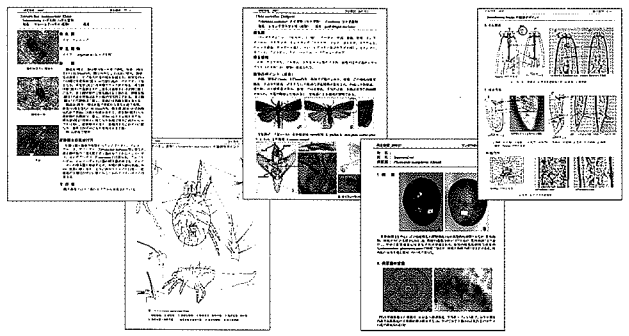
輸入検疫で発見された
わが国未報告の重要病害
「グラジオラスさび病」
学名:*Uromyces transversalis*

"Gladiolus rust disease," an important disease previously unreported in Japan that was discovered through import quarantine.
Scientific name: *Uromyces transversalis*



輸入検疫で発見された
わが国未発生のカメムシ
学名:*Stenozygum coloratum*

A stinkbug not existing in Japan that was discovered through import quarantine
Scientific name:*Stenozygum coloratum*



▲同定資料
Identification materials

高度な植物検疫のために

For highly advanced plant quarantine

高度な植物検疫を行うための調査研究を 続けています。

Continuing research for highly advanced plant quarantine

植物検疫を高度に行うためには、絶えず最新の情報を収集しながら、検査技術や分析技術、消毒技術などの開発、向上を図って、検疫の現場に活かすことが重要です。植物防疫所では専門の施設・体制を整備する中、日々調査研究に取り組んでいます。また、植物防疫官の資質向上のために体系的な研修を実施しています。

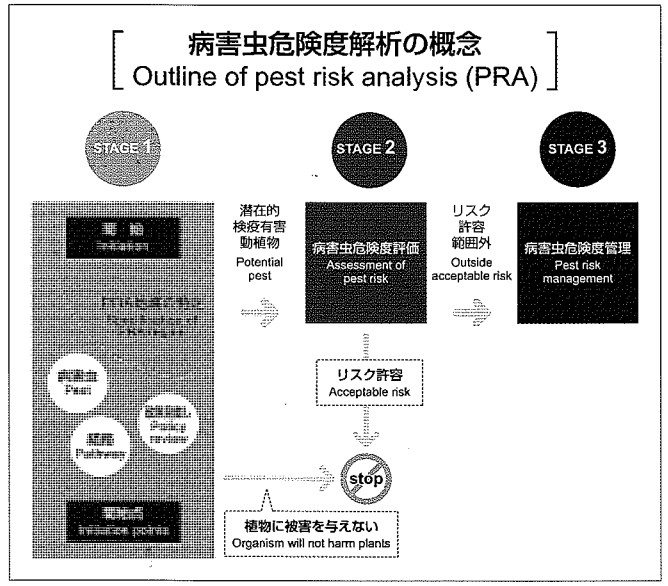
Making highly advanced plant quarantine a reality requires constant collection of the latest data; development and improvement of technologies for inspection, analysis, and sterilization; and application of these data and technologies in actual quarantine activity. Plant Protection Stations are engaged in daily research as part of their efforts to establish specialized facilities and systems. And they provide systematic training intended to improve the quality of quarantine officials.

●病害虫危険度評価

非常に多種多様に存在する病害虫について、日本での発生の有無、日本への侵入の可能性、日本でのまん延の可能性や農作物などへの被害の大きさなど、病害虫の危険度を解析し、その危険度に応じた適確な検疫方法の決定に関しての調査研究を行っています。

Pest risk analysis

Plant Protection Stations analyze the risks posed by the extremely diverse range of pests - e.g., pest occurrences in Japan, possibility for infiltration into Japan, possibility for spread in Japan, degree of damage to crops, etc. - and conduct research that aids in deciding quarantine methods that are appropriate for the degree of risk.

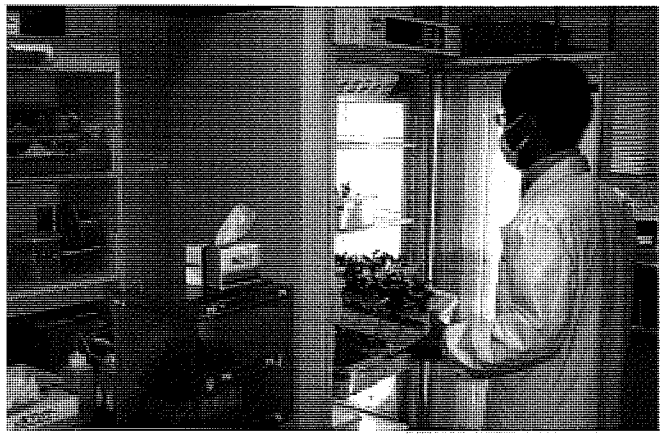


●害虫に関する調査研究

世界各地に発生している害虫の情報を収集・解析するとともに、生態や被害が不明な害虫については、発生国から導入して各種調査を行うことによって、検査技術の開発などを行っています。

Research on pests

Plant Protection Stations develop inspection technologies by gathering and analyzing data on pest occurences worldwide, and by conducting various studies that bring in pests whose ecologies and impact on plants are unknown from their countries of origin.



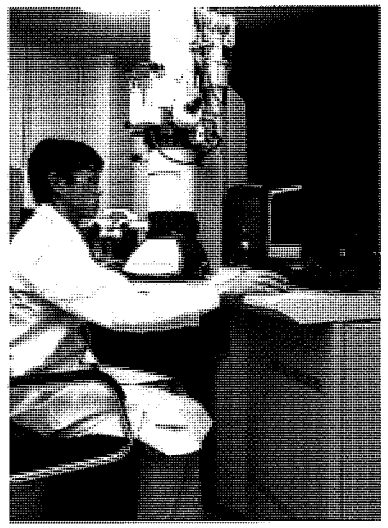
▲害虫の人工飼育
Artificial breeding

●植物病原体に関する調査研究

日本未発生病原体の発生地域での疫学、生態、防除などの情報収集およびそれらの病原体を導入して、形態、生理生化学的性質、血清学的性質、分子生物学的性質などに関する基礎研究を行っています。

Research on phytopathogens

Plant Protection Stations conduct basic research on the form, physiological and biochemical nature, serological nature, molecular biological nature, and other aspects of pathogens not found in Japan by collecting data on epidemiology, ecology, control, etc., in the areas in which the pathogens exist and introducing the pathogens into research in Japan.



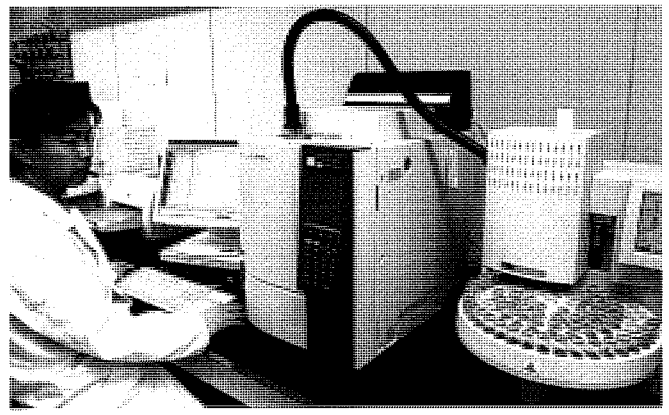
◀ウイルスの電子顕微鏡観察
Observation of a virus using an electron microscope

●消毒技術の開発

植物検疫では病害虫が発見された植物を的確かつ安全に消毒することが重要です。このため、化学的・物理的方法による消毒技術の開発を行っています。

Development of sterilization technologies

Precise and safe sterilization of plants that are found to have pests is an important part of plant quarantine. For this reason, Plant Protection Stations develop sterilization practices that use chemical and physical methods.



▲ガスクロマトグラフィーによる分析
Analysis using gas chromatography

●検疫データの整備

輸出入植物の種類や生産国(地域)、検査で発見された病害虫の種類などの植物検疫の実績データは、植物検疫の現場において効率的な検疫を行うため、また輸出入者など関係者にとっても重要です。植物検疫統計データは、年次報告のほか、週ごとの速報値がホームページで公開され誰でも利用することが可能です。

Maintaining quarantine data

Data acquired from plant quarantines - including data on types of imported/exported plants, countries (regions) of origin of such plants, and types of pests discovered in quarantine - are essential to the work of conducting efficient on-site quarantine and are an important resource for importers, exporters, and other concerned personnel. Statistical data from plant quarantine are made available through annual reports, and preliminary figures are released on websites each week. Such data can be used by anyone.


農林水産省
植物防疫所
輸入植物品目別・国別検査表

所	種類別	単位	月計 検査 件数	月計 検査 数量	月計 消毒 件数	月計 消毒 数量	累積 件数	累積 数量
全所	大分類(04)	基本(04-11)						
	ナラシコ属	小計	590	11181545	32	408580	0	0
	カスミソウ属	小計	57	257575	15	128500	0	0
	オウセイボク属	小計	1	100	0	0	0	0
	ヒユ属	小計	13	3365	0	0	0	0
	アエミエ属	小計	4	340	0	0	0	0
	クリスマスローズ属	小計	8	408	0	0	0	0
	ウスノアシガタ属(ラナンキュラス属)	小計	12	1050	0	0	0	0
	ハス属	小計	1	150	0	0	0	0
	ヒツジグサ属	小計	9	1930	0	0	0	0
	マンネングサ属	小計	1	90	0	0	0	0
	アスティルベ属	小計	3	330	0	0	0	0
	ハコネコゴメグサ属	小計	31	11380	0	0	0	0
	アクティニクス属	小計	4	45185	0	0	0	0
	アストラティナ属	小計	61	33550	0	0	0	0
	エリンジューム属	小計	18	52850	2	8400	0	0
	カララム属	小計	3	329375	0	0	0	0
	イブキソウ属	小計	20	86170	5	19800	1	1200
	トルコギキョウ属	小計	87	773973	26	303190	0	0
	カンレイソウ属	小計	3	720	0	0	0	0
	ヒロウス属	小計	5	1050	0	0	0	0
	キンギョソウ属	小計	3	5670	0	0	0	0
	クワカラソウ属	小計	2	800	0	0	0	0
	マツムシソウ属	小計	12	7170	0	0	0	0
	スウネンソウ属	小計	15	10060	4	4500	0	0
	その他	小計	4	3665	1	1125	1	1000

▲ホームページで公開しているデータのメニュー画面検索結果
Data menu screen of search results made available on the Internet

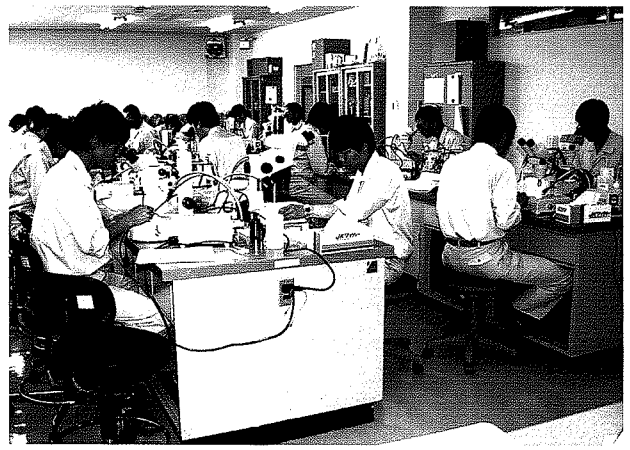
■植物防疫官研修　Training of quarantine officials

さまざまな専門分野の研修を行っています。

Training is being provided in a variety of specialized fields.

研修センターでは植物検疫業務に必要な植物学、応用動物昆虫学、植物病理学、農薬学、消毒技術、植物防疫行政、貿易などの広範な知識や技術習得、海外への対応のための語学などのカリキュラムが年間を通じて組まれ、的確な業務が行えるよう研鑽を積んでいます。

Through the training center's curriculum, quarantine officials acquire a broad range of skills and knowledge necessary for the work of plant quarantine throughout the year. Fields include botany, applied zoology and entomology, plant pathology, agricultural chemicals, sterilization techniques, plant quarantine administration, and trade practices. They also participate in language training so that they can work with overseas personnel. In this way, quarantine officials are learning the skills needed to correctly conduct their duties.



▲害虫識別法の実習
Practical study of pest identification methods

専門知識を活かした業務にも積極的に協力しています。

Actively cooperating in operations that utilize specialized knowledge

植物防疫所では、より正確で迅速な検査の実施のため、病害虫の識別能力の向上に努めており、これらの技術により、「特定外来生物による生態系等に係る被害の防止に関する法律」に基づき規制されている外来生物の判別に協力しています。

また、植物防疫所では遺伝子診断等の新しい病害虫判別技術の導入にも努めております。この遺伝子診断技術により、「遺伝子組換え生物等の使用等の規制による生物の多様性の確保に関する法律(カルタヘナ法)」に基づく未承認遺伝子組換え農作物の混入について検査を実施しています。

▲遺伝子組換え生物体の分析
Analysis of genetically modified organisms

Plant Protection Stations work to improve their capabilities for identifying pests so that they can conduct inspections faster and more accurately. They also use these technologies to distinguish alien species that are regulated by the Invasive Alien Species Act.

Plant Protection Stations also work to introduce new pest-differentiation technologies, such as genetic testing. The stations apply this genetic testing technology in inspections to determine the existence of unauthorized genetically modified crops in products based on the Law Concerning the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms (the "Cartagena Protocol domestic law").

●外来生物の輸入に関するお問い合わせ先
For inquiries concerning import of alien species, please contact:

環境省自然環境局野生生物課外来生物対策室
Office for Alien Species Management, Wildlife Division, Nature Conservation Bureau, Ministry of the Environment
TEL:03-3581-3351(代表)　FAX:03-3581-7090

外来生物法ホームページ
Invasive Alien Species Act website
http://www.env.go.jp/nature/intro/

●カルタヘナ法に基づく未承認遺伝子組換え農産物の検査に関するお問い合わせ先
For inquiries concerning inspections for unauthorized genetically modified crops based on the Cartagena law, please contact:

農林水産省消費・安全局農産安全管理課
Plant Products Safety Division; Food Safety and Consumer Affairs; Ministry of Agriculture, Forestry and Fisheries
TEL:03-3502-8111(代表)　FAX:03-3580-8592

カルタヘナ法関連情報ホームページ
Website with information on the Cartagena Law
http://www.maff.go.jp/carta/index.html

手続きの簡素化や利便性の向上にも取り組んでいます。

Working to simplify procedures and improve convenience

電子申請

植物防疫所では、各種申請・届出を利用者の自宅や事務所からオンラインで提出することができるよう、電子申請システムを設置しています。各種申請・届出は、全国どこの植物防疫所へも提出できるようにする必要があるため、全国の植物防疫所をつなぐオンラインネットワークを整備して対応しています。

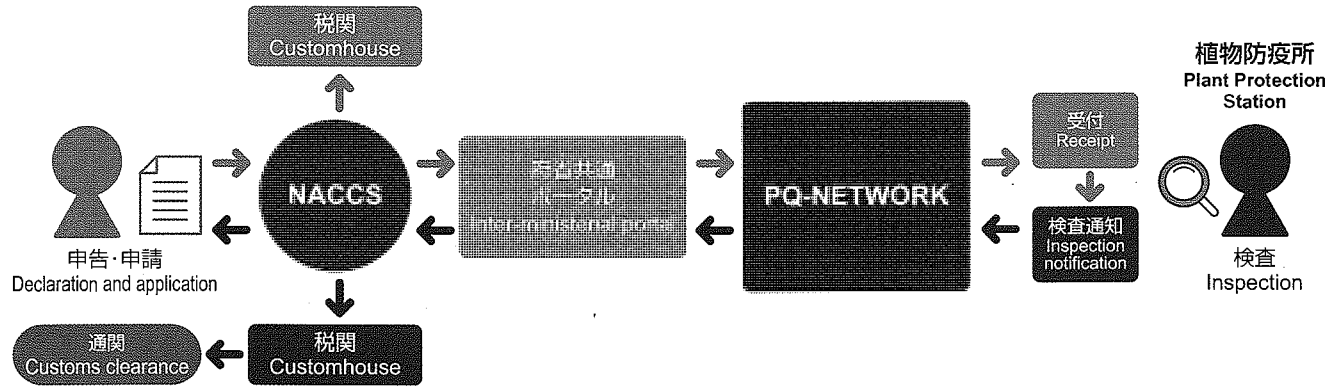
特に、輸入植物の検査申請を処理するシステムは、PQ-NETWORK(輸入植物検査手続電算処理システム)と呼ばれ、植物を輸入する場合に必要な手続き(申請書・届出の提出と証明書・通知書の受け取り)を行うことができるシステムとなっています。税関手続きを電子的に処理するシステムであるNACCSと各省庁に接続する府省共通ポータル(平成20年10月稼動)を介し接続することによって、輸入手続きおよび利用者の業務の簡素化・迅速化を図っています。PQ-NETWORKでは、わが国における輸入植物(貨物)の総検査申請数のうち、約85%が処理されています。

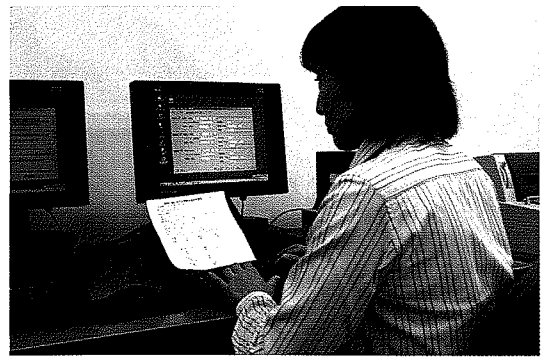
Electronic application

Plant Protection Stations are establishing an electronic application system that will allow users to submit applications and notifications online from their homes or offices. Because making it possible to submit applications and notifications to any Plant Protection Station in Japan is important, all Plant Protection Stations are linked by an online network.

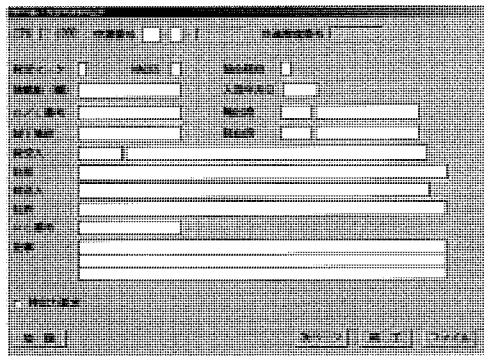
Specifically, Plant Protection Stations use a system for processing applications for inspection of imported plants-called PQ-NETWORK (Plant Quarantine Network) - that is capable of handling procedures necessary when importing such plants (e.g., submittal of application forms and notifications, receipt of certificates and notifications). Connecting PQ-NETWORK to NACCS, a system for electronic processing of customs procedures, through an inter-ministerial portal (to come on line in October 2008) will simplify and accelerate import procedures and user operations. PQ-NETWORK will handle approximately 85% of all applications for import plant (cargo) inspections in Japan.

[PQ-NETWORKによる輸入検疫の流れ　Flowchart of import quarantine using PQ-NETWORK]

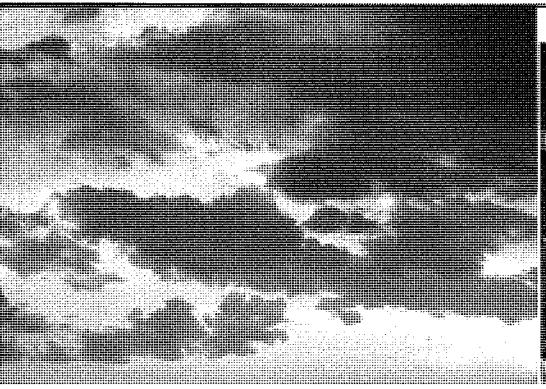




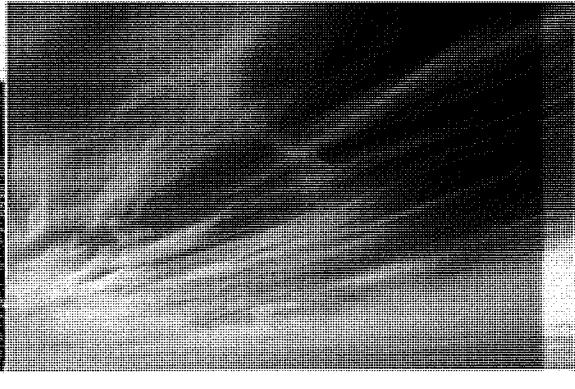
▲オンラインによる検査申請
Online inspection application



▲申請情報入力画面
Screen for inputting application information





海空港を中心とした全国ネットワーク

A national network focused on seaports and airports

■本　所(5)　Head office
■支　所(15)　Sub-station
■出張所(48)　Branch
▒駐　在(4)　Plant inspectors' office

那覇植物防疫事務所
Naha Plant Protection Station

1	那覇	Naha
2	那覇空港	Naha Airport
3	嘉手納	Kadena
4	平良	Hirara
5	石垣	Ishigaki

門司植物防疫所
Moji Plant Protection Station

1	門司	Moji
2	下関	Shimonoseki
3	福岡	Fukuoka
4	福岡空港	Fukuoka Airport
5	伊万里	Imari
6	長崎	Nagasaki
7	鹿児島	Kagoshima
8	八代	Yatsushiro
9	大分	Oita
10	細島	Hososhima
11	志布志	Shibushi
12	鹿児島空港	Kagoshima Airport
13	名瀬	Naze

神戸植物防疫所
Kobe Plant Protection Station

1	神戸	Kobe
2	姫路	Himeji
3	関西空港	Kansai Airport
4	大阪	Osaka
5	舞鶴	Maizuru
6	和歌山	Wakayama
7	広島	Hiroshima
8	広島空港	Hiroshima Airport
9	境港	Sakaiminato
10	浜田	Hamada
11	水島	Mizushima
12	尾道	Onomichi
13	岩国	Iwakuni
14	坂出	Sakaide
15	小松島	Komatsushima
16	松山	Matsuyama
17	高知	Kochi

横浜植物防疫所
Yokohama Plant Protection Station

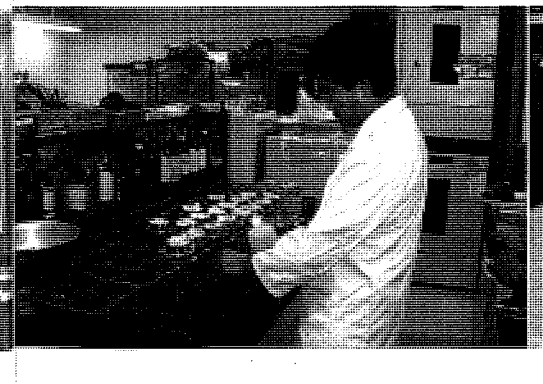
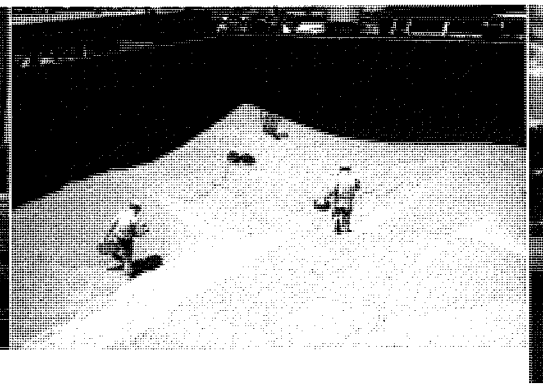
1	札幌	Sapporo
2	新千歳空港	Shinchitose Airport
3	釧路	Kushiro
4	留萌	Rumoi
5	小樽	Otaru
6	室蘭・苫小牧	Muroran-Tomakomai
7	函館	Hakodate
8	塩釜	Shiogama
9	仙台空港	Sendai Airport
10	青森	Aomori
11	八戸	Hachinohe
12	宮古	Miyako
13	石巻	Ishinomaki
14	小名浜	Onahama
15	新潟	Niigata
16	秋田	Akita
17	酒田	Sakata
18	直江津	Naoetsu
19	成田	Narita
20	羽田空港	Haneda Airport
21	東京	Tokyo
22	鹿島	Kashima
23	千葉	Chiba
24	横浜	Yokohama
25	川崎	Kawasaki
26	小笠原	Ogasawara

名古屋植物防疫所
Nagoya Plant Protection Station

1	伏木富山	Fushiki-Toyama
2	金沢	Kanazawa
3	敦賀	Tsuruga
4	清水	Shimizu
5	豊橋	Toyohashi
6	蒲郡	Gamagori
7	名古屋	Nagoya
8	衣浦	Kinuura
9	南部	Nanbu
10	四日市	Yokkaichi
11	中部空港	Chubu Airport

※掲載の地図は、植物防疫所、支所、出張所および駐在の位置関係を模式的に表した略図であり、島嶼などは正確に表現されていません。




INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

ISPM No. 11

PEST RISK ANALYSIS FOR QUARANTINE PESTS INCLUDING ANALYSIS OF ENVIRONMENTAL RISKS AND LIVING MODIFIED ORGANISMS

(2004)

Produced by the Secretariat of the International Plant Protection Convention

CONTENTS

ENDORSEMENT

ISPM No. 11 was endorsed by the Interim Commission on Phytosanitary Measures in April 2001. In April 2003, the Interim Commission on Phytosanitary Measures endorsed a supplement to ISPM No. 11 (Pest risk analysis for quarantine pests) on analysis of environmental risk and agreed that it should be integrated into ISPM No. 11. This resulted in ISPM No. 11 Rev. 1 (Pest risk analysis for quarantine pests including analysis of environmental risks). In April 2004, the Interim Commission on Phytosanitary Measures endorsed a supplement on pest risk analysis for living modified organisms (LMOs) and agreed that it should be integrated into ISPM No. 11 Rev. 1. This has been done to produce the present standard, ISPM No. 11 (2004). The supplementary text on environmental risks is marked with "*S1*" and the supplementary text on LMOs is marked with "*S2*".

The Interim Commission on Phytosanitary Measures acknowledges the collaboration and support of the Secretariat of the Convention on Biological Diversity, as well as the participation of experts from Parties to the Convention, in the preparation of the supplements to ISPM No. 11.

INTRODUCTION[1]

SCOPE

The standard provides details for the conduct of pest risk analysis (PRA) to determine if pests are quarantine pests. It describes the integrated processes to be used for risk assessment as well as the selection of risk management options.

S1 It also includes details regarding the analysis of risks of plant pests to the environment and biological diversity, including those risks affecting uncultivated/unmanaged plants, wild flora, habitats and ecosystems contained in the PRA area. Some explanatory comments on the scope of the IPPC in regard to environmental risks are given in Annex 1.

S2 It includes guidance on evaluating potential phytosanitary risks to plants and plant products posed by living modified organisms (LMOs). This guidance does not alter the scope of ISPM No. 11 but is intended to clarify issues related to the PRA for LMOs. Some explanatory comments on the scope of the IPPC in regard to PRA for LMOs are given in Annex 2.

REFERENCES

Agreement on the Application of Sanitary and Phytosanitary Measures, 1994. World Trade Organization, Geneva.
S2 *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*, 2000. CBD, Montreal.
S2 *Code of conduct for the import and release of biological control agents*, 1996. ISPM No. 3, FAO, Rome.
S2 *Convention on Biological Diversity*, 1992. CBD, Montreal.
Determination of pest status in an area, 1998. ISPM No. 8, FAO, Rome.
Export certification system, 1997. ISPM No. 7, FAO, Rome
S2 *Glossary of Biotechnology for Food and Agriculture*, 2002. Research and Technology Paper 9, FAO, Rome.
Glossary of phytosanitary terms, 2004. ISPM No. 5, FAO, Rome.
S2 *Glossary supplement No. 1: Guidelines on the interpretation and application of the concept of official control for regulated pests*, 2001. ISPM No. 5, FAO, Rome.
S2 *Glossary supplement No. 2: Guidelines on the understanding of potential economic importance and related terms including reference to environmental considerations*, 2003. ISPM No. 5, FAO, Rome.
Guidelines for pest risk analysis, 1996. ISPM No. 2, FAO, Rome.
S2 *Guidelines for phytosanitary certificates*, 2001. ISPM No. 12, FAO, Rome.
Guidelines for surveillance, 1998. ISPM No. 6, FAO, Rome.
International Plant Protection Convention, 1997. FAO, Rome.
Principles of plant quarantine as related to international trade, 1995. ISPM No. 1, FAO, Rome.
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.

DEFINITIONS

Definitions of phytosanitary terms used in the present standard can be found in ISPM No. 5 (*Glossary of phytosanitary terms*).

[1] Throughout this text, *S1* indicates the supplementary text on environmental risks and *S2* the supplementary text on living modified organisms. See complete explanation in the section *Endorsement* on page 1.

OUTLINE OF REQUIREMENTS

The objectives of a PRA are, for a specified area, to identify pests and/or pathways of quarantine concern and evaluate their risk, to identify endangered areas, and, if appropriate, to identify risk management options. Pest risk analysis (PRA) for quarantine pests follows a process defined by three stages:

Stage 1 (initiating the process) involves identifying the pest(s) and pathways that are of quarantine concern and should be considered for risk analysis in relation to the identified PRA area.

Stage 2 (risk assessment) begins with the categorization of individual pests to determine whether the criteria for a quarantine pest are satisfied. Risk assessment continues with an evaluation of the probability of pest entry, establishment, and spread, and of their potential economic consequences (including environmental consequences - S1).

Stage 3 (risk management) involves identifying management options for reducing the risks identified at stage 2. These are evaluated for efficacy, feasibility and impact in order to select those that are appropriate.

PEST RISK ANALYSIS FOR QUARANTINE PESTS

1. Stage 1: Initiation

The aim of the initiation stage is to identify the pest(s) and pathways which are of quarantine concern and should be considered for risk analysis in relation to the identified PRA area.

S2 Some LMOs may present a phytosanitary risk and therefore warrant a PRA. However other LMOs will not present phytosanitary risks beyond those posed by related non-LMOs and therefore will not warrant a complete PRA. Thus, for LMOs, the aim of the Initiation stage is to identify those LMOs that have the characteristics of a potential pest and need to be assessed further, and those which need no further assessment under ISPM No. 11.

S2 LMOs are organisms that have been modified using techniques of modern biotechnology to express one or more new or altered traits. In most cases, the parent organism is not normally considered to be a plant pest but an assessment may need to be performed to determine if the genetic modification (i.e. gene, new gene sequence that regulates other genes, or gene product) results in a new trait or characteristic that may present a plant pest risk.

S2 A plant pest risk from LMOs may be presented by:

- the organism(s) with the inserted gene(s) (i.e. the LMO)
- the combination of genetic material (e.g. gene from plant pests such as viruses) or
- the consequences of the genetic material moving to another organism.

1.1 Initiation points

The PRA process may be initiated as a result of:

- the identification of a pathway that presents a potential pest hazard
- the identification of a pest that may require phytosanitary measures
- the review or revision of phytosanitary policies and priorities.

S1 The initiation points frequently refer to "pests". The IPPC defines a pest as "any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products." In applying these initiation points to the specific case of plants as pests, it is important to note that the plants concerned should satisfy this definition. Pests directly affecting plants satisfy this definition. In addition, many organisms indirectly affecting plants also satisfy this definition (such as weeds/invasive plants). The fact that they are injurious to plants can be based on evidence obtained in an area where they occur. In the case of organisms where there is insufficient evidence that they affect plants indirectly, it may nevertheless be appropriate to assess on the basis of available pertinent information, whether they are potentially injurious in the PRA area by using a clearly documented, consistently applied and transparent system. This is particularly important for plant species or cultivars that are imported for planting.

S2 The types of LMOs that an NPPO may be asked to assess for phytosanitary risk include:

- plants for use (a) as agricultural crops, for food and feed, ornamental plants or managed forests; (b) in bioremediation (as an organism that cleans up contamination); (c) for industrial purposes (e.g. production of enzymes or bioplastics); (d) as therapeutic agents (e.g. pharmaceutical production)
- biological control agents modified to improve their performance in that role
- pests modified to alter their pathogenic characteristic and thereby make them useful for biological control (see ISPM No. 3: Code of conduct for the import and release of exotic biological control agents)
- organisms genetically modified to improve their characteristics such as for biofertilizer or other influences on soil, bioremediation or industrial uses.

S2 In order to be categorized as a pest, an LMO has to be injurious or potentially injurious to plants or plant products under conditions in the PRA area. This damage may be in the form of direct effects on plants or plant products, or indirect effects. For guidance on the process of determining whether an LMO has the potential to be a pest, refer to Annex 3, Determining the potential for a living modified organism to be a pest.

1.1.1 PRA initiated by the identification of a pathway

The need for a new or revised PRA of a specific pathway may arise in the following situations:

- international trade is initiated in a commodity not previously imported into the country (usually a plant or plant product, including genetically altered plants) or a commodity from a new area or new country of origin
- new plant species are imported for selection and scientific research purposes
- a pathway other than commodity import is identified (natural spread, packing material, mail, garbage, passenger baggage, etc.).

A list of pests likely to be associated with the pathway (e.g. carried by the commodity) may be generated by any combination of official sources, databases, scientific and other literature, or expert consultation. It is preferable to prioritize the listing, based on expert judgement on pest distribution and types of pests. If no potential quarantine pests are identified as likely to follow the pathway, the PRA may stop at this point.

S2 The phrase "genetically altered plants" is understood to mean plants obtained through the use of modern biotechnology.

1.1.2 PRA initiated by the identification of a pest

A requirement for a new or revised PRA on a specific pest may arise in the following situations:

- an emergency arises on discovery of an established infestation or an outbreak of a new pest within a PRA area
- an emergency arises on interception of a new pest on an imported commodity
- a new pest risk is identified by scientific research
- a pest is introduced into an area
- a pest is reported to be more damaging in an area other than in its area of origin
- a pest is repeatedly intercepted
- a request is made to import an organism
- an organism is identified as a vector for other pests
- an organism is genetically altered in a way which clearly identifies its potential as a plant pest.

S2 The phrase "genetically altered" is understood to include obtained through the use of modern biotechnology.

1.1.3 PRA initiated by the review or revision of a policy

A requirement for a new or revised PRA originating from policy concerns will most frequently arise in the following situations:

- a national decision is taken to review phytosanitary regulations, requirements or operations
- a proposal made by another country or by an international organization (RPPO, FAO) is reviewed
- a new treatment or loss of a treatment system, a new process, or new information impacts on an earlier decision
- a dispute arises on phytosanitary measures
- the phytosanitary situation in a country changes, a new country is created, or political boundaries have changed.

1.2 Identification of PRA area

The PRA area should be defined as precisely as possible in order to identify the area for which information is needed.

1.3 Information

Information gathering is an essential element of all stages of PRA. It is important at the initiation stage in order to clarify the identity of the pest(s), its/their present distribution and association with host plants, commodities, etc. Other information will be gathered as required to reach necessary decisions as the PRA continues.

Information for PRA may come from a variety of sources. The provision of official information regarding pest status is an obligation under the IPPC (Art. VIII.1c) facilitated by official contact points (Art. VIII.2).

S1 For environmental risks, the variety of sources of information will generally be wider than traditionally used by NPPOs. Broader inputs may be required. These sources may include environmental impact assessments, but it should be recognized that such assessments usually do not have the same purpose as PRA and cannot substitute for PRA.

S2 For LMOs, information required for a full risk analysis may include:

- name, identity and taxonomic status of the LMO (including any relevant identifying codes) and the risk management measures applied to the LMO in the country of export
- taxonomic status, common name, point of collection or acquisition, and characteristics of the donor organism
- description of the nucleic acid or the modification introduced (including genetic construct) and the resulting genotypic and phenotypic characteristics of the LMO
- details of the transformation process
- appropriate detection and identification methods and their specificity, sensitivity and reliability
- intended use including intended containment
- quantity or volume of the LMO to be imported.

S2 Information regarding pest status is an obligation under the IPPC (Article VIII.1c) facilitated by official contact points (Article VIII.2). A country may have obligations to provide information about LMOs under other international agreements such as the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000; Cartagena Protocol). The Cartagena Protocol has a Biosafety Clearing-house that may contain relevant information. Information on

LMOs is sometimes commercially sensitive and applicable obligations with regard to release and handling of information should be observed.

1.3.1 Previous PRA

A check should also be made as to whether pathways, pests or policies have already been subjected to the PRA process, either nationally or internationally. If a PRA exists, its validity should be checked as circumstances and information may have changed. The possibility of using a PRA from a similar pathway or pest, that may partly or entirely replace the need for a new PRA, should also be investigated.

1.4 Conclusion of initiation

At the end of Stage 1, the initiation point, the pests and pathways of concern and the PRA area will have been identified. Relevant information has been collected and pests have been identified as possible candidates for phytosanitary measures, either individually or in association with a pathway.

S2 For LMOs at the end of Stage 1 an NPPO may decide that the LMO:

- is a potential pest and needs to be assessed further in Stage 2 or
- is not a potential pest and needs no further analysis under ISPM No. 11 (but see also the following paragraph).

S2 PRA under the IPPC only relates to the assessment and management of phytosanitary risks. As with other organisms or pathways assessed by an NPPO, LMOs may present other risks not falling within the scope covered by the IPPC. For LMOs, PRA may constitute only a portion of the required overall risk analysis. For example, countries may require the assessment of risks to human or animal health or to the environment beyond that covered by the IPPC. When an NPPO discovers potential for risks that are not phytosanitary it may be appropriate to notify the relevant authorities.

2. Stage 2: Pest Risk Assessment

The process for pest risk assessment can be broadly divided into three interrelated steps:

- pest categorization
- assessment of the probability of introduction and spread
- assessment of potential economic consequences (including environmental impacts).

In most cases, these steps will be applied sequentially in a PRA but it is not essential to follow a particular sequence. Pest risk assessment needs to be only as complex as is technically justified by the circumstances. This standard allows a specific PRA to be judged against the principles of necessity, minimal impact, transparency, equivalence, risk analysis, managed risk and non-discrimination set out in ISPM No. 1: Principles of plant quarantine as related to international trade (FAO, 1995).

S2 For LMOs, from this point forward in PRA, it is assumed that the LMO is being assessed as a pest and therefore "LMO" refers to an LMO that is a potential quarantine pest due to new or altered characteristics or properties resulting from the genetic modification. The risk assessment should be carried out on a case-by-case basis. LMOs that have pest characteristics unrelated to the genetic modification should be assessed using the normal procedures.

2.1 Pest categorization

At the outset, it may not be clear which pest(s) identified in Stage 1 require a PRA. The categorization process examines for each pest whether the criteria in the definition for a quarantine pest are satisfied.

In the evaluation of a pathway associated with a commodity, a number of individual PRAs may be necessary for the various pests potentially associated with the pathway. The opportunity to eliminate an organism or organisms from consideration before in-depth examination is undertaken is a valuable characteristic of the categorization process.

An advantage of pest categorization is that it can be done with relatively little information, however information should be sufficient to adequately carry out the categorization.

2.1.1 Elements of categorization

The categorization of a pest as a quarantine pest includes the following primary elements:

- identity of the pest
- presence or absence in the PRA area
- regulatory status
- potential for establishment and spread in PRA area
- potential for economic consequences (including environmental consequences) in the PRA area.

2.1.1.1 Identity of pest

The identity of the pest should be clearly defined to ensure that the assessment is being performed on a distinct organism, and that biological and other information used in the assessment is relevant to the organism in question. If this is not possible because the causal agent of particular symptoms has not yet been fully identified, then it should have been shown to produce consistent symptoms and to be transmissible.

The taxonomic unit for the pest is generally species. The use of a higher or lower taxonomic level should be supported by scientifically sound rationale. In the case of levels below the species, this should include evidence demonstrating that factors such as differences in virulence, host range or vector relationships are significant enough to affect phytosanitary status.

In cases where a vector is involved, the vector may also be considered a pest to the extent that it is associated with the causal organism and is required for transmission of the pest.

S2 In the case of LMOs, identification requires information regarding characteristics of the recipient or parent organism, the donor organism, the genetic construct, the gene or transgene vector and the nature of the genetic modification. Information requirements are set out under section 1.3.

2.1.1.2 Presence or absence in PRA area

The pest should be absent from all or a defined part of the PRA area.

S2 In the case of LMOs, this should relate to the LMO of phytosanitary concern.

2.1.1.3 Regulatory status

If the pest is present but not widely distributed in the PRA area, it should be under official control or expected to be under official control in the near future.

S1 Official control of pests presenting an environmental risk may involve agencies other than the NPPO. However, it is recognized that ISPM No. 5 Glossary of phytosanitary terms, Supplement No. 1 on official control, in particular Section 5.7, applies.

S2 In the case of LMOs, official control should relate to the phytosanitary measures applied because of the pest nature of the LMO. It may be appropriate to consider any official control measures in place for the parent organism, donor organism, transgene vector or gene vector.

2.1.1.4 Potential for establishment and spread in PRA area

Evidence should be available to support the conclusion that the pest could become established or spread in the PRA area. The PRA area should have ecological/climatic conditions including those in protected conditions suitable for the establishment and spread of the pest and where relevant, host species (or near relatives), alternate hosts and vectors should be present in the PRA area.

S2 For LMOs, the following should also be considered:

- changes in adaptive characteristics resulting from the genetic modification that may increase the potential for establishment and spread
- gene transfer or gene flow that may result in the establishment and spread of pests, or the emergence of new pests
- genotypic and phenotypic instability that could result in the establishment and spread of organisms with new pest characteristics, e.g. loss of sterility genes designed to prevent outcrossing.

S2 For more detailed guidance on the assessment of these characteristics, see Annex 3.

2.1.1.5 Potential for economic consequences in PRA area

There should be clear indications that the pest is likely to have an unacceptable economic impact (including environmental impact) in the PRA area.

S1 Unacceptable economic impact is described in ISPM No. 5, Glossary of phytosanitary terms, Supplement No. 2: Guidelines on the understanding of potential economic importance and related terms.

S2 In the case of LMOs, the economic impact (including environmental impact) should relate to the pest nature (injurious to plants and plant products) of the LMO.

2.1.2 Conclusion of pest categorization

If it has been determined that the pest has the potential to be a quarantine pest, the PRA process should continue. If a pest does not fulfil all of the criteria for a quarantine pest, the PRA process for that pest may stop. In the absence of sufficient information, the uncertainties should be identified and the PRA process should continue.

2.2 Assessment of the probability of introduction and spread

Pest introduction is comprised of both entry and establishment. Assessing the probability of introduction requires an analysis of each of the pathways with which a pest may be associated from its origin to its establishment in the PRA area. In a PRA initiated by a specific pathway (usually an imported commodity), the probability of pest entry is evaluated for the pathway in question. The probabilities for pest entry associated with other pathways need to be investigated as well.

For risk analyses that have been initiated for a specific pest, with no particular commodity or pathway under consideration, the potential of all probable pathways should be considered.

The assessment of probability of spread is based primarily on biological considerations similar to those for entry and establishment.

S1 With respect to a plant being assessed as a pest with indirect effects, wherever a reference is made to a host or a host range, this should be understood to refer instead to a suitable habitat[2] (that is a place where the plant can grow) in the PRA area.

S1 The intended habitat is the place where the plants are intended to grow and the unintended habitat is the place where the plants are not intended to grow.

S1 In the case of plants to be imported, the concepts of entry, establishment and spread have to be considered differently.

S1 Plants for planting that are imported will enter and then be maintained in an intended habitat, probably in substantial numbers and for an indeterminate period. Accordingly, Section 2.2.1 on Entry does not apply. The risk arises because of the probability that the plant may spread from the intended habitat to unintended habitats within the PRA area, and then establish in those habitats. Accordingly, section 2.2.3 may be considered before section 2.2.2. Unintended habitats may occur in the vicinity of the intended habitat in the PRA area.

S1 Imported plants not intended to be planted may be used for different purposes (e.g. used as bird seed, as fodder, or for processing). The risk arises because of the probability that the plant may escape or be diverted from the intended use to an unintended habitat and establish there.

S2 Assessing the probability of introduction of an LMO requires an analysis of both intentional or unintentional pathways of introduction, and intended use.

2.2.1 Probability of entry of a pest

The probability of entry of a pest depends on the pathways from the exporting country to the destination, and the frequency and quantity of pests associated with them. The higher the number of pathways, the greater the probability of the pest entering the PRA area.

Documented pathways for the pest to enter new areas should be noted. Potential pathways, which may not currently exist, should be assessed. Pest interception data may provide evidence of the ability of a pest to be associated with a pathway and to survive in transport or storage.

S1 In the case of plants to be imported, the plants will enter and an assessment of probability of entry will not be required. Therefore this section does not apply. However, this section does apply to pests that may be carried by such plants (e.g. weed seeds with seeds imported for planting).

S2 This section is not relevant to LMOs imported for intentional release into the environment.

[2] In the case of organisms that affect plants indirectly, through effects on other organisms, the terms host/habitat will extend also to those other organisms.

2.2.1.1 Identification of pathways for a PRA initiated by a pest

All relevant pathways should be considered. They can be identified principally in relation to the geographical distribution and host range of the pest. Consignments of plants and plant products moving in international trade are the principal pathways of concern and existing patterns of such trade will, to a substantial extent, determine which pathways are relevant. Other pathways such as other types of commodities, packing materials, persons, baggage, mail, conveyances and the exchange of scientific material should be considered where appropriate. Entry by natural means should also be assessed, as natural spread is likely to reduce the effectiveness of phytosanitary measures.

S2 For LMOs, all relevant pathways of introduction should be considered (intentional and unintentional).

2.2.1.2 Probability of the pest being associated with the pathway at origin

The probability of the pest being associated, spatially or temporally, with the pathway at origin should be estimated. Factors to consider are:

- prevalence of the pest in the source area
- occurrence of the pest in a life-stage that would be associated with commodities, containers, or conveyances
- volume and frequency of movement along the pathway
- seasonal timing
- pest management, cultural and commercial procedures applied at the place of origin (application of plant protection products, handling, culling, roguing, grading).

2.2.1.3 Probability of survival during transport or storage

Examples of factors to consider are:

- speed and conditions of transport and duration of the life cycle of the pest in relation to time in transport and storage
- vulnerability of the life-stages during transport or storage
- prevalence of pest likely to be associated with a consignment
- commercial procedures (e.g. refrigeration) applied to consignments in the country of origin, country of destination, or in transport or storage.

2.2.1.4 Probability of pest surviving existing pest management procedures

Existing pest management procedures (including phytosanitary procedures) applied to consignments against other pests from origin to end-use, should be evaluated for effectiveness against the pest in question. The probability that the pest will go undetected during inspection or survive other existing phytosanitary procedures should be estimated.

2.2.1.5 Probability of transfer to a suitable host

Factors to consider are:

- dispersal mechanisms, including vectors to allow movement from the pathway to a suitable host
- whether the imported commodity is to be sent to a few or many destination points in the PRA area
- proximity of entry, transit and destination points to suitable hosts
- time of year at which import takes place
- intended use of the commodity (e.g. for planting, processing and consumption)
- risks from by-products and waste.

Some uses are associated with a much higher probability of introduction (e.g. planting) than others (e.g. processing). The probability associated with any growth, processing, or disposal of the commodity in the vicinity of suitable hosts should also be considered.

S2 For LMOs, the probability of gene flow and gene transfer should also be considered, when there is a trait of phytosanitary concern that may be transferred.

2.2.2 Probability of establishment

In order to estimate the probability of establishment of a pest, reliable biological information (life cycle, host range, epidemiology, survival etc.) should be obtained from the areas where the pest currently occurs. The situation in the PRA area can then be compared with that in the areas where it currently occurs (taking account also of protected environments such as glass- or greenhouses) and expert judgement used to assess the probability of establishment. Case histories concerning comparable pests can be considered. Examples of the factors to consider are:

- availability, quantity and distribution of hosts in the PRA area
- environmental suitability in the PRA area
- potential for adaptation of the pest

- reproductive strategy of the pest
- method of pest survival
- cultural practices and control measures.

In considering probability of establishment, it should be noted that a transient pest (see ISPM No. 8: Determination of pest status in an area) may not be able to establish in the PRA area (e.g. because of unsuitable climatic conditions) but could still have unacceptable economic consequences (see IPPC Art. VII.3).

S1 In the case of plants to be imported, the assessment of the probability of establishment concerns the unintended habitats.

S2 For LMOs, the survival capacity without human intervention should also be considered.

S2 In addition, where gene flow is a concern in the PRA area, the probability of expression and establishment of a trait of phytosanitary concern should be considered.

S2 Case histories concerning comparable LMOs or other organisms carrying the same construct can be considered.

2.2.2.1 Availability of suitable hosts, alternate hosts and vectors in the PRA area

Factors to consider are:

- whether hosts and alternate hosts are present and how abundant or widely distributed they may be
- whether hosts and alternate hosts occur within sufficient geographic proximity to allow the pest to complete its life cycle
- whether there are other plant species, which could prove to be suitable hosts in the absence of the usual host species
- whether a vector, if needed for dispersal of the pest, is already present in the PRA area or likely to be introduced
- whether another vector species occurs in the PRA area.

The taxonomic level at which hosts are considered should normally be the "species". The use of higher or lower taxonomic levels should be justified by scientifically sound rationale.

2.2.2.2 Suitability of environment

Factors in the environment (e.g. suitability of climate, soil, pest and host competition) that are critical to the development of the pest, its host and if applicable its vector, and to their ability to survive periods of climatic stress and complete their life cycles, should be identified. It should be noted that the environment is likely to have different effects on the pest, its host and its vector. This needs to be recognized in determining whether the interaction between these organisms in the area of origin is maintained in the PRA area to the benefit or detriment of the pest. The probability of establishment in a protected environment, e.g. in glasshouses, should also be considered.

Climatic modelling systems may be used to compare climatic data on the known distribution of a pest with that in the PRA area.

2.2.2.3 Cultural practices and control measures

Where applicable, practices employed during the cultivation/production of the host crops should be compared to determine if there are differences in such practices between the PRA area and the origin of the pest that may influence its ability to establish.

S2 For plants that are LMOs, it may also be appropriate to consider specific cultural, control or management practices.

Pest control programs or natural enemies already in the PRA area which reduce the probability of establishment may be considered. Pests for which control is not feasible should be considered to present a greater risk than those for which treatment is easily accomplished. The availability (or lack) of suitable methods for eradication should also be considered.

2.2.2.4 Other characteristics of the pest affecting the probability of establishment

These include:

- *Reproductive strategy of the pests and method of pest survival* - Characteristics, which enable the pest to reproduce effectively in the new environment, such as parthenogenesis/self-crossing, duration of the life cycle, number of generations per year, resting stage etc., should be identified.
- *Genetic adaptability* - Whether the species is polymorphic and the degree to which the pest has demonstrated

the ability to adapt to conditions like those in the PRA area should be considered, e.g., host-specific races or races adapted to a wider range of habitats or to new hosts. This genotypic (and phenotypic) variability facilitates a pest's ability to withstand environmental fluctuations, to adapt to a wider range of habitats, to develop pesticide resistance and to overcome host resistance.

- *Minimum population needed for establishment* - If possible, the threshold population that is required for establishment should be estimated.

S2 For LMOs, if there is evidence of genotypic and phenotypic instability, this should be considered.

S2 It may also be appropriate to consider proposed production and control practices related to the LMO in the country of import.

2.2.3 Probability of spread after establishment

A pest with a high potential for spread may also have a high potential for establishment, and possibilities for its successful containment and/or eradication are more limited. In order to estimate the probability of spread of the pest, reliable biological information should be obtained from areas where the pest currently occurs. The situation in the PRA area can then be carefully compared with that in the areas where the pest currently occurs and expert judgement used to assess the probability of spread. Case histories concerning comparable pests can usefully be considered. Examples of the factors to consider are:

- suitability of the natural and/or managed environment for natural spread of the pest
- presence of natural barriers
- the potential for movement with commodities or conveyances
- intended use of the commodity
- potential vectors of the pest in the PRA area
- potential natural enemies of the pest in the PRA area.

S1 In the case of plants to be imported, the assessment of spread concerns spread from the intended habitat or the intended use to an unintended habitat, where the pest may establish. Further spread may then occur to other unintended habitats.

The information on probability of spread is used to estimate how rapidly a pest's potential economic importance may be expressed within the PRA area. This also has significance if the pest is liable to enter and establish in an area of low potential economic importance and then spread to an area of high potential economic importance. In addition it may be important in the risk management stage when considering the feasibility of containment or eradication of an introduced pest.

S1 Certain pests may not cause injurious effects on plants immediately after they establish, and in particular may only spread after a certain time. In assessing the probability of spread, this should be considered, based on evidence of such behaviour.

2.2.4 Conclusion on the probability of introduction and spread

The overall probability of introduction should be expressed in terms most suitable for the data, the methods used for analysis, and the intended audience. This may be quantitative or qualitative, since either output is in any case the result of a combination of both quantitative and qualitative information. The probability of introduction may be expressed as a comparison with that obtained from PRAs on other pests.

2.2.4.1 Conclusion regarding endangered areas

The part of the PRA area where ecological factors favour the establishment of the pest should be identified in order to define the endangered area. This may be the whole of the PRA area or a part of the area.

2.3 Assessment of potential economic consequences

Requirements described in this step indicate what information relative to the pest and its potential host plants should be assembled, and suggest levels of economic analysis that may be carried out using that information in order to assess all the effects of the pest, i.e. the potential economic consequences. Wherever appropriate, quantitative data that will provide monetary values should be obtained. Qualitative data may also be used. Consultation with an economist may be useful.

In many instances, detailed analysis of the estimated economic consequences is not necessary if there is sufficient evidence or it is widely agreed that the introduction of a pest will have unacceptable economic consequences (including environmental consequences). In such cases, risk assessment will primarily focus on the probability of introduction and spread. It will, however, be necessary to examine economic factors in greater detail when the level of economic

consequences is in question, or when the level of economic consequences is needed to evaluate the strength of measures used for risk management or in assessing the cost-benefit of exclusion or control.

S2 In the case of LMOs, the economic impact (including environmental impact) should relate to the pest nature (injurious to plants and plant products) of the LMO.

S2 For LMOs, the following evidence should also be considered:

- potential economic consequences that could result from adverse effects on non-target organisms that are injurious to plants or plant products
- economic consequences that could result from pest properties.

S2 For more detailed guidance on the assessment of these characteristics, see Annex 3.

2.3.1 Pest effects

In order to estimate the potential economic importance of the pest, information should be obtained from areas where the pest occurs naturally or has been introduced. This information should be compared with the situation in the PRA area. Case histories concerning comparable pests can usefully be considered. The effects considered may be direct or indirect.

S1 The basic method for estimating the potential economic importance of pests in this section also applies to:

- pests affecting uncultivated/unmanaged plants
- weeds and/or invasive plants and
- pests affecting plants through effects on other organisms.

S1 In the case of direct and indirect environmental effects, specific evidence is needed.

S1 In the case of plants to be imported for planting, the long-term consequences for the intended habitat may be included in the assessment. Planting may affect further use or have a harmful effect on the intended habitat.

S1 Environmental effects and consequences considered should result from effects on plants. Such effects, however, on plants may be less significant than the effects and/or consequences on other organisms or systems. For example, a minor weed may be significantly allergenic for humans or a minor plant pathogen may produce toxins that seriously affect livestock. However, the regulation of plants solely on the basis of their effects on other organisms or systems (e.g. on human or animal health) is outside the scope of this standard. If the PRA process reveals evidence of a potential hazard to other organisms or systems, this should be communicated to the appropriate authorities which have the legal responsibility to deal with the issue.

2.3.1.1 Direct pest effects

For identification and characterization of the direct effects of the pest on each potential host in the PRA area, or those effects which are host-specific, the following are examples that could be considered:

- known or potential host plants (in the field, under protected cultivation, or in the wild)
- types, amount and frequency of damage
- crop losses, in yield and quality
- biotic factors (e.g. adaptability and virulence of the pest) affecting damage and losses
- abiotic factors (e.g. climate) affecting damage and losses
- rate of spread
- rate of reproduction
- control measures (including existing measures), their efficacy and cost
- effect on existing production practices
- environmental effects.

For each of the potential hosts, the total area of the crop and area potentially endangered should be estimated in relation to the elements given above.

S1 In the case of the analysis of environmental risks, examples of direct pest effects on plants and/or their environmental consequences that could be considered include:

- reduction of keystone plant species;
- reduction of plant species that are major components of ecosystems (in terms of abundance or size), and endangered native plant species (including effects below species level where there is evidence of such effects being significant);
- significant reduction, displacement or elimination of other plant species.

S1 The estimation of the area potentially endangered should relate to these effects.

2.3.1.2 Indirect pest effects

For identification and characterization of the indirect effects of the pest in the PRA area, or those effects that are not host-specific, the following are examples that could be considered:

- effects on domestic and export markets, including in particular effects on export market access. The potential consequences for market access which may result if the pest becomes established, should be estimated. This involves considering the extent of any phytosanitary regulations imposed (or likely to be imposed) by trading partners
- changes to producer costs or input demands, including control costs
- changes to domestic or foreign consumer demand for a product resulting from quality changes
- environmental and other undesired effects of control measures
- feasibility and cost of eradication or containment
- capacity to act as a vector for other pests
- resources needed for additional research and advice
- social and other effects (e.g. tourism).

S1 In the case of the analysis of environmental risks, examples of indirect pest effects on plants and/or their environmental consequences that could be considered include:

- significant effects on plant communities
- significant effects on designated environmentally sensitive or protected areas
- significant change in ecological processes and the structure, stability or processes of an ecosystem (including further effects on plant species, erosion, water table changes, increased fire hazard, nutrient cycling, etc.)
- effects on human use (e.g. water quality, recreational uses, tourism, animal grazing, hunting, fishing); and
- costs of environmental restoration.

S1 Effects on human and animal health (e.g. toxicity, allergenicity), water tables, tourism, etc. could also be considered, as appropriate, by other agencies/authorities.

2.3.2 Analysis of economic consequences

2.3.2.1 Time and place factors

Estimations made in the previous section related to a hypothetical situation where the pest is supposed to have been introduced and to be fully expressing its potential economic consequences (per year) in the PRA area. In practice, however, economic consequences are expressed with time, and may concern one year, several years or an indeterminate period. Various scenarios should be considered. The total economic consequences over more than one year can be expressed as net present value of annual economic consequences, and an appropriate discount rate selected to calculate net present value.

Other scenarios could concern whether the pest occurs at one, few or many points in the PRA area and the expression of potential economic consequences will depend on the rate and manner of spread in the PRA area. The rate of spread may be envisaged to be slow or rapid; in some cases, it may be supposed that spread can be prevented. Appropriate analysis may be used to estimate potential economic consequences over the period of time when a pest is spreading in the PRA area. In addition, many of the factors or effects considered above could be expected to change over time, with the consequent effects of potential economic consequences. Expert judgement and estimations will be required.

2.3.2.2 Analysis of commercial consequences

As determined above, most of the direct effects of a pest, and some of the indirect effects will be of a commercial nature, or have consequences for an identified market. These effects, which may be positive or negative, should be identified and quantified. The following may usefully be considered:

- effect of pest-induced changes to producer profits that result from changes in production costs, yields or prices
- effect of pest-induced changes in quantities demanded or prices paid for commodities by domestic and international consumers. This could include quality changes in products and/or quarantine-related trade restrictions resulting from a pest introduction.

2.3.2.3 Analytical techniques

There are analytical techniques which can be used in consultation with experts in economics to make a more detailed analysis of the potential economic effects of a quarantine pest. These should incorporate all of the effects that have been identified. These techniques may include:

- *partial budgeting*: this will be adequate, if the economic effects induced by the action of the pest to producer profits are generally limited to producers and are considered to be relatively minor
- *partial equilibrium*: this is recommended if, under point 2.3.2.2, there is a significant change in producer profits, or if there is a significant change in consumer demand. Partial equilibrium analysis is necessary to measure welfare changes, or the net changes arising from the pest impacts on producers and consumers
- *general equilibrium*: if the economic changes are significant to a national economy, and could cause changes to factors such as wages, interest rates or exchange rates, then general equilibrium analysis could be used to establish the full range of economic effects.

The use of analytical techniques is often limited by lack of data, by uncertainties in the data, and by the fact that for certain effects only qualitative information can be provided.

2.3.2.4 Non-commercial and environmental consequences

Some of the direct and indirect effects of the introduction of a pest determined in 2.3.1.1 and 2.3.1.2 will be of an economic nature, or affect some type of value, but not have an existing market which can be easily identified. As a result, the effects may not be adequately measured in terms of prices in established product or service markets. Examples include in particular environmental effects (such as ecosystem stability, biodiversity, amenity value) and social effects (such as employment, tourism) arising from a pest introduction. These impacts could be approximated with an appropriate non-market valuation method. More details on environment are given below.

If quantitative measurement of such consequences is not feasible, qualitative information about the consequences may be provided. An explanation of how this information has been incorporated into decisions should also be provided.

S1 Application of this standard to environmental hazards requires clear categorization of environmental values and how they can be assessed. The environment can be valued using different methodologies, but these methodologies are best used in consultation with experts in economics. Methodologies may include consideration of "use" and "non-use" values. "Use" values arise from consumption of an element of the environment, such as accessing clean water, or fishing in a lake, and also those that are non-consumptive, such as use of forests for leisure activities. "Non-use" values may be subdivided into:

- "option value" (value for use at a later date)
- "existence value" (knowledge that an element of the environment exists) and
- "bequest value" (knowledge that an element of the environment is available for future generations).

S1 Whether the element of the environment is being assessed in terms of use or non-use values, methods exist for their valuation, such as market-based approaches, surrogate markets, simulated markets, and benefit transfer. Each has advantages, disadvantages and situations where it is particularly useful.

S1 The assessment of consequences may be either quantitative or qualitative and in many cases, qualitative data is sufficient. A quantitative method may not exist to address a situation (e.g. catastrophic effects on a keystone species), or a quantitative analysis may not be possible (no methods available). Useful analyses can be based on non-monetary valuations (number of species affected, water quality), or expert judgement, if the analyses follow documented, consistent and transparent procedures.

S1 Economic impact is described in ISPM No. 5: Glossary of phytosanitary terms, Supplement No. 2: Guidelines on the understanding of potential economic importance and related terms.

2.3.3 Conclusion of the assessment of economic consequences

Wherever appropriate, the output of the assessment of economic consequences described in this step should be in terms of a monetary value. The economic consequences can also be expressed qualitatively or using quantitative measures without monetary terms. Sources of information, assumptions and methods of analysis should be clearly specified.

2.3.3.1 Endangered area

The part of the PRA area where presence of the pest will result in economically important loss should be identified as appropriate. This is needed to define the endangered area.

2.4 Degree of uncertainty

Estimation of the probability of introduction of a pest and of its economic consequences involves many uncertainties. In particular, this estimation is an extrapolation from the situation where the pest occurs to the hypothetical situation in the PRA area. It is important to document the areas of uncertainty and the degree of uncertainty in the assessment, and to

indicate where expert judgement has been used. This is necessary for transparency and may also be useful for identifying and prioritizing research needs.

S1 It should be noted that the assessment of the probability and consequences of environmental hazards of pests of uncultivated and unmanaged plants often involves greater uncertainty than for pests of cultivated or managed plants. This is due to the lack of information, additional complexity associated with ecosystems, and variability associated with pests, hosts or habitats.

2.5 Conclusion of the pest risk assessment stage

As a result of the pest risk assessment, all or some of the categorized pests may be considered appropriate for pest risk management. For each pest, all or part of the PRA area may be identified as an endangered area. A quantitative or qualitative estimate of the probability of introduction of a pest or pests, and a corresponding quantitative or qualitative estimate of economic consequences (including environmental consequences), have been obtained and documented or an overall rating could have been assigned. These estimates, with associated uncertainties, are utilized in the pest risk management stage of the PRA.

3. Stage 3: Pest Risk Management

The conclusions from pest risk assessment are used to decide whether risk management is required and the strength of measures to be used. Since zero-risk is not a reasonable option, the guiding principle for risk management should be to manage risk to achieve the required degree of safety that can be justified and is feasible within the limits of available options and resources. Pest risk management (in the analytical sense) is the process of identifying ways to react to a perceived risk, evaluating the efficacy of these actions, and identifying the most appropriate options. The uncertainty noted in the assessments of economic consequences and probability of introduction should also be considered and included in the selection of a pest management option.

S1 In considering the management of environmental risks, it should be stressed that phytosanitary measures are intended to account for uncertainty and should be designed in proportion to the risk. Pest risk management options should be identified, taking account of the degree of uncertainty in the assessment of economic consequences, probability of introduction, and the respective technical justification of those options. In this respect, the management of risks to the environment caused by plant pests does not differ from the management of other plant pest risks.

3.1 Level of risk

The principle of "managed risk" (ISPM No. 1: Principles of plant quarantine as related to international trade) states that: "Because some risk of introduction of a quarantine pest always exists, countries shall agree to a policy of risk management when formulating phytosanitary measures." In implementing this principle, countries should decide what level of risk is acceptable to them.

The acceptable level of risk may be expressed in a number of ways, such as:

- reference to existing phytosanitary requirements
- indexed to estimated economic losses
- expressed on a scale of risk tolerance
- compared with the level of risk accepted by other countries.

S2 For LMOs, the acceptable level of risk may also be expressed by comparison to the level of risk associated with similar or related organisms, based on their characteristics and behaviour in a similar environment to the PRA area.

3.2 Technical information required

The decisions to be made in the pest risk management process will be based on the information collected during the preceding stages of PRA. This information will be composed of:

- reasons for initiating the process
- estimation of the probability of introduction to the PRA area
- evaluation of potential economic consequences in the PRA area.

3.3 Acceptability of risk

Overall risk is determined by the examination of the outputs of the assessments of the probability of introduction and the economic impact. If the risk is found to be unacceptable, then the first step in risk management is to identify possible phytosanitary measures that will reduce the risk to, or below an acceptable level. Measures are not justified if the risk is already acceptable or must be accepted because it is not manageable (as may be the case with natural spread). Countries may decide that a low level of monitoring or audit is maintained to ensure that future changes in the pest risk are identified.

3.4 Identification and selection of appropriate risk management options

Appropriate measures should be chosen based on their effectiveness in reducing the probability of introduction of the pest. The choice should be based on the following considerations, which include several of the *Principles of plant quarantine as related to international trade* (ISPM No. 1):

- *Phytosanitary measures shown to be cost-effective and feasible* - The benefit from the use of phytosanitary measures is that the pest will not be introduced and the PRA area will, consequently, not be subjected to the potential economic consequences. The cost-benefit analysis for each of the minimum measures found to provide acceptable security may be estimated. Those measures with an acceptable benefit-to-cost ratio should be considered.
- *Principle of "minimal impact"* - Measures should not be more trade restrictive than necessary. Measures should be applied to the minimum area necessary for the effective protection of the endangered area.
- *Reassessment of previous requirements* - No additional measures should be imposed if existing measures are effective.
- *Principle of "equivalence"* - If different phytosanitary measures with the same effect are identified, they should be accepted as alternatives.
- *Principle of "non-discrimination"* - If the pest under consideration is established in the PRA area but of limited distribution and under official control, the phytosanitary measures in relation to import should not be more stringent than those applied within the PRA area. Likewise, phytosanitary measures should not discriminate between exporting countries of the same phytosanitary status.

S1 The principle of non-discrimination and the concept of official control also apply to:

- pests affecting uncultivated/unmanaged plants
- weeds and/or invasive plants and
- pests affecting plants through effects on other organisms.

S1 If any of these become established in the PRA area and if official control is applied, then phytosanitary measures at import should not be more stringent than the official control measures.

The major risk of introduction of plant pests is with imported consignments of plants and plant products, but (especially for a PRA performed on a particular pest) it is necessary to consider the risk of introduction with other types of pathways (e.g. packing materials, conveyances, travellers and their luggage, and the natural spread of a pest).

The measures listed below are examples of those that are most commonly applied to traded commodities. They are applied to pathways, usually consignments of a host, from a specific origin. The measures should be as precise as possible as to consignment type (hosts, parts of plants) and origin so as not to act as barriers to trade by limiting the import of products where this is not justified. Combinations of two or more measures may be needed in order to reduce the risk to an acceptable level. The available measures can be classified into broad categories which relate to the pest status of the pathway in the country of origin. These include measures:

- applied to the consignment
- applied to prevent or reduce original infestation in the crop
- to ensure the area or place of production is free from the pest
- concerning the prohibition of commodities.

Other options may arise in the PRA area (restrictions on the use of a commodity), control measures, introduction of a biological control agent, eradication, and containment. Such options should also be evaluated and will apply in particular if the pest is already present but not widely distributed in the PRA area.

3.4.1 Options for consignments

Measures may include any combinations of the following:

- inspection or testing for freedom from a pest or to a specified pest tolerance; sample size should be adequate to give an acceptable probability of detecting the pest
- prohibition of parts of the host
- a pre-entry or post-entry quarantine system - this system could be considered to be the most intensive form of inspection or testing where suitable facilities and resources are available, and may be the only option for certain pests not detectable on entry
- specified conditions of preparation of the consignment (e.g. handling to prevent infestation or reinfestation)
- specified treatment of the consignment - such treatments are applied post-harvest and could include chemical, thermal, irradiation or other physical methods
- restrictions on end use, distribution and periods of entry of the commodity.

Measures may also be applied to restrict the import of consignments of pests.

S1 The concept of consignments of pests may be applied to the import of plants considered to be pests. These consignments may be restricted to species or varieties posing less risk.

S2 For LMOs, as for other organisms, information may have been obtained concerning the risk management measures applied to the LMO in the country of export (see section 1.3). These should be assessed to determine if they are appropriate for the conditions in the PRA area and, if appropriate, the intended use.

S2 For LMOs, measures may also include procedures for the provision of information on the phytosanitary integrity of consignments (e.g. tracing systems, documentation systems, identity preservation systems).

3.4.2 Options preventing or reducing infestation in the crop

Measures may include:

- treatment of the crop, field, or place of production
- restriction of the composition of a consignment so that it is composed of plants belonging to resistant or less susceptible species
- growing plants under specially protected conditions (glasshouse, isolation)
- harvesting of plants at a certain age or a specified time of year
- production in a certification scheme. An officially monitored plant production scheme usually involves a number of carefully controlled generations, beginning with nuclear stock plants of high health status. It may be specified that the plants be derived from plants within a limited number of generations.

S2 Measures may be applied to reduce the probability that LMOs (or genetic material from LMOs) that pose a phytosanitary risk could be in other crops. These include:

- management systems (e.g. buffer zones, refugia)
- management of trait expression
- control of reproductive ability (e.g. male sterility)
- control of alternative hosts.

3.4.3 Options ensuring that the area, place or site of production or crop is free from the pest

Measures may include:

- pest-free area - requirements for pest-free area status are described in ISPM No. 4: *Requirements for the establishment of pest free areas*
- pest-free place of production or pest-free production site - requirements are described in ISPM No. 10: *Requirements for the establishment of pest free places of production and pest-free production sites*
- inspection of crop to confirm pest freedom.

3.4.4 Options for other types of pathways

For many types of pathways, the measures considered above for plants and plant products to detect the pest in the consignment or to prevent infestation of the consignment, may also be used or adapted. For certain types of pathways, the following factors should be considered:

- Natural spread of a pest includes movement of the pest by flight, wind dispersal, transport by vectors such as insects or birds and natural migration. If the pest is entering the PRA area by natural spread, or is likely to enter in the immediate future, phytosanitary measures may have little effect. Control measures applied in the area of origin could be considered. Similarly, containment or eradication, supported by suppression and surveillance, in the PRA area after entry of the pest could be considered.
- Measures for human travellers and their baggage could include targeted inspections, publicity and fines or incentives. In a few cases, treatments may be possible.
- Contaminated machinery or modes of transport (ships, trains, planes, road transport) could be subjected to cleaning or disinfestation.

3.4.5 Options within the importing country

Certain measures applied within the importing country may also be used. These could include careful surveillance to try and detect the entry of the pest as early as possible, eradication programmes to eliminate any foci of infestation and/or containment action to limit spread.

S1 For plants to be imported, where there is a high level of uncertainty regarding pest risk, it may be decided not to take phytosanitary measures at import, but only to apply surveillance or other procedures after entry (e.g. by or under the supervision of the NPPO).

S2 The potential for risk from LMO pests depends in part on the intended use. As for other organisms, certain intended uses (such as high security contained use) may significantly manage risk.

S2 For LMOs, as with other pests, options within the country also include the use of emergency measures related to phytosanitary risks. Any emergency measures should be consistent with Article VII.6 of the IPPC (1997).

3.4.6 Prohibition of commodities

If no satisfactory measure to reduce risk to an acceptable level can be found, the final option may be to prohibit importation of the relevant commodities. This should be viewed as a measure of last resort and should be considered in light of the anticipated efficacy, especially in instances where the incentives for illegal import may be significant.

3.5 Phytosanitary certificates and other compliance measures

Risk management includes the consideration of appropriate compliance procedures. The most important of these is export certification (see ISPM No. 7: *Export certification system*). The issuance of phytosanitary certificates (see ISPM No. 12: *Guidelines for Phytosanitary Certificates*) provides official assurance that a consignment is "considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of the importing contracting party." It thus confirms that the specified risk management options have been followed. An additional declaration may be required to indicate that a particular measure has been carried out. Other compliance measures may be used subject to bilateral or multilateral agreement.

S2 Information on Phytosanitary Certificates regarding LMOs (as with any other regulated articles) should only be related to phytosanitary measures (see ISPM No. 12: *Guidelines for phytosanitary certificates*).

3.6 Conclusion of pest risk management

The result of the pest risk management procedure will be either that no measures are identified which are considered appropriate or the selection of one or more management options that have been found to lower the risk associated with the pest(s) to an acceptable level. These management options form the basis of phytosanitary regulations or requirements.

The application and maintenance of such regulations is subject to certain obligations, in the case of contracting parties to the IPPC.

S1 Phytosanitary measures taken in relation to environmental hazards should, as appropriate, be notified to relevant competent authorities responsible for national biodiversity policies, strategies and action plans.

S1 It is noted that the communication of risks associated with environmental hazards is of particular importance to promote awareness.

3.6.1 Monitoring and review of phytosanitary measures

The principle of "modification" states: "As conditions change, and as new facts become available, phytosanitary measures shall be modified promptly, either by inclusion of prohibitions, restrictions or requirements necessary for their success, or by removal of those found to be unnecessary" (ISPM No. 1: *Principles of plant quarantine as related to international trade*).

Thus, the implementation of particular phytosanitary measures should not be considered to be permanent. After application, the success of the measures in achieving their aim should be determined by monitoring during use. This is often achieved by inspection of the commodity on arrival, noting any interceptions or any entries of the pest to the PRA area. The information supporting the pest risk analysis should be periodically reviewed to ensure that any new information that becomes available does not invalidate the decision taken.

4. Documentation of Pest Risk Analysis

4.1 Documentation requirements

The IPPC and the principle of "transparency" (ISPM No. 1: *Principles of plant quarantine as related to international trade*) require that countries should, on request, make available the rationale for phytosanitary requirements. The whole process from initiation to pest risk management should be sufficiently documented so that when a review or a dispute arises, the sources of information and rationale used in reaching the management decision can be clearly demonstrated.

The main elements of documentation are:

- purpose for the PRA
- pest, pest list, pathways, PRA area, endangered area
- sources of information
- categorized pest list
- conclusions of risk assessment
  - probability
  - consequences
- risk management
  - options identified
- options selected.

S1 **ANNEX 1**

COMMENTS ON THE SCOPE OF THE IPPC IN REGARD TO ENVIRONMENTAL RISKS

The full range of pests covered by the IPPC extends beyond pests directly affecting cultivated plants. The coverage of the IPPC definition of plant pests includes weeds and other species that have indirect effects on plants, and the Convention applies to the protection of wild flora. The scope of the IPPC also extends to organisms which are pests because they:

- *directly affect uncultivated/unmanaged plants*

Introduction of these pests may have few commercial consequences, and therefore they have been less likely to be evaluated, regulated and/or placed under official control. An example of this type of pest is Dutch elm disease (Ophiostoma novo-ulmi).

- *indirectly affect plants*

In addition to pests that directly affect host plants, there are those, like most weeds/invasive plants, which affect plants primarily by other processes such as competition (e.g. for cultivated plants: Canada thistle (Cirsium arvense) [weed of agricultural crops], or for uncultivated/unmanaged plants: Purple loosestrife (Lythrum salicaria) [competitor in natural and semi-natural habitats]).

- *indirectly affect plants through effects on other organisms*

Some pests may primarily affect other organisms, but thereby cause deleterious effects on plant species, or plant health in habitats or ecosystems. Examples include parasites of beneficial organisms, such as biological control agents.

To protect the environment and biological diversity without creating disguised barriers to trade, environmental risks and risks to biological diversity should be analyzed in a PRA.

S2 **ANNEX 2**

COMMENTS ON THE SCOPE OF THE IPPC IN REGARD TO PEST RISK ANALYSIS FOR LIVING MODIFIED ORGANISMS

Phytosanitary risks that may be associated with a living modified organism (LMO) are within the scope of the International Plant Protection Convention (IPPC) and should be considered using pest risk analysis (PRA) to make decisions regarding pest risk management.

The analysis of LMOs includes consideration of the following:

- Some LMOs may present a phytosanitary risk and therefore warrant a PRA. However other LMOs will not present a phytosanitary risks beyond those posed by related non-LMOs and therefore will not warrant a complete PRA. For example, modifications to change the physiological characteristics of a plant (e.g. ripening time, storage life) may not present any phytosanitary risk. The pest risk that may be posed by an LMO is dependent on a combination of factors, including the characteristics of the donor and recipient organisms, the genetic alteration, and the specific new trait or traits. Therefore, part of the supplementary text (see Annex 3) provides guidance on how to determine if an LMO is a potential pest.
- PRA may constitute only a portion of the overall risk analysis for import and release of a LMO. For example, countries may require the assessment of risks to human or animal health, or to the environment, beyond that covered by the IPPC. This standard only relates to the assessment and management of phytosanitary risks. As with other organisms or pathways assessed by an NPPO, LMOs may present other risks not falling within the scope of the IPPC. When an NPPO discovers potential for risks that are not of phytosanitary concern it may be appropriate to notify the relevant authorities.
- Phytosanitary risks from LMOs may result from certain traits introduced into the organism, such as those that increase the potential for establishment and spread, or from inserted gene sequences that do not alter the pest characteristics of the organism but that might act independently of the organism or have unintended consequences.
- In cases of phytosanitary risks related to gene flow, the LMO is acting more as a potential vector or pathway for introduction of a genetic construct of phytosanitary concern rather than as a pest in and of itself. Therefore, the term "pest" should be understood to include the potential of an LMO to act as a vector or pathway for introduction of a gene presenting a potential phytosanitary risk.
- The risk analysis procedures of the IPPC are generally concerned with phenotypic characteristics rather than genotypic characteristics. However, genotypic characteristics may need to be considered when assessing the phytosanitary risks of LMOs.
- Potential phytosanitary risks that may be associated with LMOs could also be associated with non-LMOs. It may be useful to consider risks associated with LMOs in the context of risks posed by the non-modified recipient or parental organisms, or similar organisms, in the PRA area.

S2 **ANNEX 3**

DETERMINING THE POTENTIAL FOR A LIVING MODIFIED ORGANISM TO BE A PEST

This annex is relevant for living modified organisms (LMOs) only where there is potential for phytosanitary risks from the LMO associated with some characteristic or property related to the genetic modification. Other phytosanitary risks associated with the organism should be assessed under other appropriate sections of ISPM No. 11 or under other appropriate ISPMs.

The information requirements outlined in section 1.3 may be needed in determining the potential for an LMO to be a pest.

Potential phytosanitary risks for LMOs
Potential phytosanitary risks for LMOs may include:

a. Changes in adaptive characteristics which may increase the potential for introduction or spread, for example alterations in:

- tolerance to adverse environmental conditions (e.g. drought, freezing, salinity etc.)
- reproductive biology
- dispersal ability of pests
- growth rate or vigour
- host range
- pest resistance
- pesticide (including herbicide) resistance or tolerance.

b. Adverse effects of gene flow or gene transfer including, for example:

- transfer of pesticide or pest resistance genes to compatible species
- the potential to overcome existing reproductive and recombination barriers resulting in pest risks
- potential for hybridization with existing organisms or pathogens to result in pathogenicity or increased pathogenicity.

c. Adverse effects on non-target organisms including, for example:

- changes in host range of the LMO, including the cases where it is intended for use as a biological control agent or organism otherwise claimed to be beneficial
- effects on other organisms, such as biological control agents, beneficial organisms, or soil fauna and microflora, nitrogen-fixing bacteria, that result in a phytosanitary impact (indirect effects)
- capacity to vector other pests
- negative direct or indirect effects of plant-produced pesticides on non-target organisms beneficial to plants.

d. Genotypic and phenotypic instability including, for example:

- reversion of an organism intended as a biocontrol agent to a virulent form.

e. Other injurious effects including, for example:

- phytosanitary risks presented by new traits in organisms that do not normally pose phytosanitary risk
- novel or enhanced capacity for virus recombination, trans-encapsidation and synergy events related to the presence of virus sequences
- phytosanitary risks resulting from nucleic acid sequences (markers, promoters, terminators, etc.) present in the insert.

The potential phytosanitary risks identified above can also be associated with non-LMOs. The risk analysis procedures of the IPPC are generally concerned with phenotypic characteristics rather than genotypic characteristics. However, genotypic characteristics may need to be considered when assessing the phytosanitary risks of LMOs.

If there is no indication that new traits resulting from genetic modifications have phytosanitary risks, the LMO may require no further consideration.

It may be useful to consider potential risks in the context of risks posed by the non-modified recipients or parental organisms, or similar organisms, in the PRA area.

In cases of phytosanitary risks related to gene flow, the LMO is acting more as a potential vector or pathway for introduction of a genetic construct of phytosanitary concern rather than as a pest in and of itself. Therefore, the term "pest" should be understood to include the potential of an LMO to act as a vector or pathway for introduction of a gene presenting a potential phytosanitary risk.

Factors that may result in the need to subject a LMO to stage 2 of the PRA include:

- lack of knowledge about a particular modification event
- the credibility of information if it is an unfamiliar modification event
- insufficient data on the behaviour of the LMO in environments similar to the PRA area
- field experience, research trials or laboratory data indicating that the LMO may pose phytosanitary risks (see sub-sections a. to e. above)
- where the LMO expresses characteristics that are associated with pests under ISPM No. 11
- existing conditions in the country (or PRA area) that may result in the LMO being a pest
- where there are PRAs for similar organisms (including LMOs) or risk analyses carried out for other purposes that indicate a pest potential
- experience in other countries.

Factors that may lead to the conclusion that an LMO is not a potential pest and/or requires no further consideration under ISPM No. 11 include:

- where the genetic modification in similar or related organisms has previously been assessed by the NPPO (or other recognized experts or agencies) as having no phytosanitary risk
- where the LMO is to be confined in a reliable containment system and not be released
- evidence from research trials that the LMO is unlikely to be a pest under the use proposed
- experience in other countries.

附件三、日本對活昆蟲及微生物之輸入規定

生きた昆虫・微生物などの輸入について

生きた昆虫・微生物などを外国から輸入する際には「特定外来生物による生態系等に係る被害の防止に関する法律（外来生物法）」、「絶滅のおそれのある野生動植物の種の国際取引に関する条約（ワシントン条約）」、「家畜伝染病予防法」など、植物防疫法以外の規制を受ける場合もあります。

その場合には環境省、税関、農林水産省動物検疫所、その他関係機関にお問い合わせください。

根拠法令	目的	規制の内容	詳細な内容
植物防疫法	農作物の保護	検疫有害動植物の輸入の規制	以下に説明
外来生物法	生態系や人への被害の防止	特定の昆虫類などの輸入の規制	環境省ホームページ[外部リンク]をご覧ください
ワシントン条約	絶滅のおそれのある野生動植物の保護	特定の昆虫類などの輸出入の規制	税関ホームページ[外部リンク]をご覧ください
家畜伝染病予防法	家畜の伝染性疾病の予防・まん延の防止	特定の動植物の輸出入の規制	農林水産省動物検疫所ホームページ[外部リンク]をご覧ください

植物防疫法による生きた昆虫・微生物などの輸入規制について

植物防疫法では、我が国の農作物や樹木などの植物を守るため、これらを害する昆虫・微生物など（検疫有害動植物）を外国から日本に持ち込むことを禁止しています。

世界中の動植物の種類は膨大で、その生態や植物への加害性などがよく知られていないものも多くあります。

植物防疫所では、これら植物への加害性がよく知られていない昆虫や微生物類の輸入の可否の照会があった場合には、種ごとに文献調査などを行って植物防疫法の規制の対象になるかどうかの判定を行っています。

これまで植物防疫所が行った判定結果のデータを取りまとめ、「生きた昆虫・微生物などの規制に関するデータベース」を作成しました。

この検索ボックスで、輸入を予定している生きた昆虫や微生物類が、植物防疫法の輸入の規制の対象になるかどうかを検索することができますので、ご利用ください。

しかし、すべての昆虫や微生物類を網羅したものではありません。このデータベースで検索されない昆虫や微生物類の「規制の有無」については、最寄りの植物防疫所に照会して、植物防疫法の規制対象になるかどうかの判定を受けてください。

なお、植物防疫法に違反して輸入が禁止されている種（「規制有」と表示される種）を輸入した場合は、罰則が適用されることがありますのでご注意ください。

また、コガネムシ上科に含まれる昆虫（カブトムシ、クワガタムシ、テナガコガネなど）については、外来生物法においても規制を受けるため、特に輸入時の手続が定められていますのでご注意ください。

コガネムシ上科の輸入手続きについては、「コガネムシ上科の輸入について」をご覧ください。

生きた昆虫・微生物などの規制に関するデータベース

簡易検索　詳細検索

種別欄にチェックを入れ、調べたい昆虫・微生物などの門/目/科/学名/和名いずれかを入力し、検索ボタンをクリックしてください。

種別(指定必須): 昆虫等動物類　微生物等植物類

キーワード: クワガタ　(スペース区切りで3つまで指定できます)

(検索結果は画面下部に表示されます)

「カブトムシ」、「クワガタムシ」ボタンをクリックすると一覧表を表示します。

カブトムシ

クワガタムシ

検索結果

779件該当しました。

列タイトルをクリックすると、行を並べ替えることができます。 Excelファイルでダウンロード

	輸入規制	目	科	学名	和名	備考
詳細	規制無	Coleoptera	Lucanidae	Aegognathus		属で非有害と判断
詳細	規制無	Coleoptera	Lucanidae	Aegognathus leuthneri		
詳細	規制無	Coleoptera	Lucanidae	Aegognathus waterhousei		
詳細	規制無	Coleoptera	Lucanidae	Aegotypus acantinus	アカンティヌスヒサゴネブト...	
詳細	規制無	Coleoptera	Lucanidae	Aegotypus curvimaxillaris	クルビマキシラリスヒサゴネ...	
詳細	規制無	Coleoptera	Lucanidae	Aegotypus naomii	ナオミヒサゴネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegotypus oberthueri	オーベルチュールヒサゴネ...	
詳細	規制無	Coleoptera	Lucanidae	Aegotypus shimanei	シマネヒサゴネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegotypus trilobatus	ヒサゴネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus acervus	アケルブスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus acuminatus	アクミナートゥスネブトクワ...	
詳細	規制無	Coleoptera	Lucanidae	Aegus acutangulus	アクタングルスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus adelphus	アデルフスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus amictus	アミクトゥスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus amplus	アンプルスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus angustus	アングストゥスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus apoensis	アポネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus arcuatus	アルクアートゥスネブトクワ...	
詳細	規制無	Coleoptera	Lucanidae	Aegus amaudi	アーナウドネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus babai	ババネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus bawangensis	バワンネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus beauchenei	ベチュエンネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus bidens	ビデンスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus bigibbosus	ビギボッススネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus bougainvillensis	ブーゲンビルネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus brevimandibularis	ブレビマンディブラリスネブ...	
詳細	規制無	Coleoptera	Lucanidae	Aegus canlaonensis	カンラオンネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus celebensis	セレベスネブトクワガタ	
詳細	規制無	Coleoptera	Lucanidae	Aegus coramonsis	セラムネブトクワガタ	

注意事項

このデータベースで検索した結果表示される「検索結果」について、具体的な説明は次のとおりです。

1 輸入規制欄に「○規制有」と表示される場合

検索された種は、検疫有害動植物であり、植物防疫法の規制を受けますので、輸入できません。

2 輸入規制欄に「-規制無」と表示される場合

検索された種は、検疫有害動植物ではありませんので、植物防疫法の規制の対象とはなっておりませんが、外来生物法やワシントン条約等で規制を受ける昆虫類や、家畜伝染病予防法で規制を受ける微生物類もあり、輸入時に確認等所定の手続きが必要な場合があります。

詳しくは、植物防疫所や関係機関（環境省、税関、農林水産省動物検疫所）までお問い合わせください。

3 「0件該当しました」又は検索したい昆虫又は微生物類が表示されない場合

植物防疫法で規制の対象になるかどうかの判定が行なわれていない種ですので、現時点では、その種を輸入することはできません。

判定が行なわれていない種を輸入したい場合は、最寄りの植物防疫所に照会し、「-規制無」と判定された種のみが輸入可能となります。

お願い

植物防疫法に違反して輸入・販売などをしているような情報がありましたら、最寄りの植物防疫所へお知らせください。

植物防疫所のお問い合わせ窓口

横浜植物防疫所業務部種苗担当 tel 045－211－7153

横浜植物防疫所成田支所第1PTB旅客担当 tel 0476－32－6694

横浜植物防疫所成田支所第2PTB旅客担当 tel 0476－34－2352

横浜植物防疫所成田支所第1航空貨物担当 tel 0476－32－6690

名古屋植物防疫所種苗担当 tel 052-651-0132

名古屋植物防疫所中部空港支所航空貨物担当 tel 0569－38－8439

名古屋植物防疫所中部空港支所旅客担当 tel 0569－38－8433

神戸植物防疫所業務部本船貨物担当 tel 078－331－1350

神戸植物防疫所関西空港支所航空貨物担当 tel 072－455－1938

神戸植物防疫所関西空港支所旅客担当 tel 072－455－1936

門司植物防疫所輸入検疫担当 tel 093－321－2601

門司植物防疫所福岡支所福岡空港出張所航空貨物担当 tel 092－477－7577

門司植物防疫所福岡支所福岡空港出張所旅客担当 tel 092－477－7575

那覇植物防疫事務所輸入検疫担当 tel 098－868－2850

隔離栽培運用基準

沿革
昭和43年5月20日 43農政B第916号
昭和58年2月15日 58農政第 670号 一部改正
昭和62年9月8日 62農蚕第5154号 一部改正
昭和63年4月18日 63農蚕第2604号 一部改正
平成01年12月15日 元農蚕第7709号 一部改正
平成03年4月8日 3農蚕第1992号 一部改正
平成04年3月27日 4農蚕第1817号 一部改正
平成06年10月31日 6農蚕第6607号 一部改正
平成06年11月29日 6農蚕第7139号 一部改正
平成09年3月31日 9農産第2322号 一部改正
平成11年8月5日 11農産第4319号 一部改正
平成12年12月21日 12農産第6718号 一部改正
平成14年2月22日 13生産第8070号 一部改正
平成14年3月6日 13生産第9560号 一部改正
平成22年1月4日 21消安第8875号 一部改正

Ⅰ　隔離対象は次に掲げる種苗

隔離対象は次に掲げる種苗（組織培養体を含む。）とする。
1　果樹類（果樹台木として利用される植物を含む。）の苗木（穂木を含む。）であって、次の属（種）に属するもの
(1) おらんだいちご属植物(Fragaria L.):おらんだいちご等
からたち属植物(Poncirus Raf.(Pseudaegle Mig.)): からたち
きいちご属植物(Rubus L.): こばのふゆいちご、しまばらいちご等
きんかん属植物(Fortunella Swingle): きんかん
くり属植物(Castanea Mill.): くり
くるみ属植物(Juglans L.): おにぐるみ、ひめぐるみ等
こけもも属植物(Vaccinium L.): こけもも、つるこけもも等
さくら属植物 (Prunus L.): アーモンド、寿星桃、すみせいようみざくら、すもも、せいようみざくら、のもも、ミロバランすもも、もも、P.cistena、P.virginiana等

すぐり属植物(Ribes L.): あめりかくろすぐり、こまがたけすぐり、ざりこみ、やぶさんざし等
なし属植物(Pyrus L.): せいようなし、まめなし、やまなし等
ぶどう属植物(Vitis L.): くまがわぶどう、しらがぶどう等
みかん属植物 (Citrus L.): オレンジ、グレープフルーツ、ザボン、レモン等
やまもも属植物(Myrica L.):やまもも
りんご属植物(Malus(Tour)Mill.): かいどう、りんご等
(2) パインアップル(Ananas comosus(L.)Merr.)
2　さつまいも(Ipomoea batatas Lam.)の生塊根及びばれいしょ(Solanum属のtuberatume 亜属を指す。) の生塊茎
3　さとうきび (Saccharum officinarum L.、S. barberi Jeswiet、S. sinense Roxb.及びこれらの交配種) の生茎葉及びその地下部
4　球根類(未展葉芽を含む。)であって、次の属 (種) に属するもの
アイリス属植物(Iris L.)
アネモネ属植物(Anemone L.): いちりんそう、にりんそう、はくさんいちげ等
アマリリス属植物(Amaryllis L.):Belladonna lily
アリアム(Allium aflatunense、A.albopilosum(=A.christophii)、A.cowanii(=A.neapolitanum)、A.cyaneum、A.flavum、A.giganteum、A.heldreichii、A.karataviense、A.moly、A.narcissiflorum、A.ostrowskianum(=A.oreophilum)、A.pulchellum、A.rosenbachianum、 A.schoenoprasum、A.schubertii、A.serratum、 A.ursinum、A.unifolium、A.victorialis)
ガランサス属植物(Galanthus L.)
グラジオラス属植物(Gladiolus L.)
グロキシニア属植物(Gloxinia L.Her.)
クロッカス属植物(Crocus L.)
シンニンギア属植物(Sinningia Nees)
すいせん属植物(Narcissus L.)
ダリア属植物(Dahlia Cav.)
チューリップ(Tulipa spp.)
ヒアシンス(Hyacinthus orientalis L.)
ヒッペアストラム属植物 (Hippeastrum Herb.)
フリージア属植物(Freesia Klatt.)
ベゴニア属植物(Begonia L.繊根種のベゴニアを除く。)
ゆり属植物 (Lilium L.): かのこゆり、すかしゆり、やまゆり等
ラナンキュラス属植物(Ranunculus L.):うまのあしがた、きつねのぼたん等
　ただし、別表に掲げる地域で生産され、同地域の国家植物防疫機関又は当該機関が認める公的検査機関(以下「検疫当局」という。)が行う検査・検定に合格し、収穫後輸出されるまでの間、検疫当局の監

下で保管及び管理が行われた植物であって、植物防疫課長が認定したものを除く。
　なお、当該植物に添付される植物検疫証明書には当該検疫当局の定める条件に合致した旨の追記がなされる。

Ⅱ　隔離場所は植物防疫所の隔離ほ場又は植物防疫所長が隔離ほ場として指定したほ場とする。
1　植物防疫所の隔離ほ場で隔離栽培する植物は、次に掲げるものとする。
(1)　Ⅰの１の(1)及び２に規定する植物
(2)　Ⅰの１の(2)、３及び４に規定する植物であって携帯品、郵便物等で輸入される比較的少量の植物
(3)　その他隔離ほ場で隔離栽培することが可能な植物
2　植物防疫所長が指定するほ場で隔離栽培を命ずることができる植物は、次に掲げるものとする。
(1)　Ⅰの１の(2)、３及び４の植物であって、貨物として輸入される大量の植物
(2)　１に掲げた植物であって植物防疫所長が特に指定したほ場で隔離栽培することが必要であると認めた植物

Ⅲ　隔離栽培の期間
1　果樹類：１年（ただし、検定上必要と認めた場合は、さらに２年間延長することができる。）
2　球根類、いも類及びさとうきび：１作期間

Ⅳ　植物防疫所の隔離ほ場以外のほ場で隔離栽培する場合は、同科の植物が隔離栽培期間中当該ほ場の周囲50メートル以内に存在しないことを条件とする。
　ただし、ガラス室（耐久性を有するパイプハウス等を含む。）内で隔離栽培する場合にあっては、隔離栽培植物と同科の植物が隔離栽培期間中同室に存在しないときは、この条件を適用しない。

Ⅴ　種苗生産者（種苗商を含む。）以外の者が観賞用として栽培する球根類（100球未満の場合を除く。）及びパインアップル（20本未満の場合を除く。）についても隔離栽培を行うものとする。

別表

別表

地域	植物
オランダ	1 アイリス属、アマリリス属及びヒッペアストラム属(検疫当局が指定した容器に封入されたものを含む。)、チューリップ属、フリージア属及びゆり属の球根並びに検疫当局が指定した容器に封入されたヒアシンスの球根 2 アリウム、グラジオラス属、クロッカス属、ダリア属及びヒアシンスの球根であって検疫当局が指定した品種 3 種子で繁殖される球根ベゴニア(*Begonia* × *tuberhybrida*)であって、播種後1作期間で収穫されるもの
チリ	ゆりの球根であって検疫当局が指定した品種
ニュージーランド	チューリップ及びゆりの球根であって検疫当局が指定した品種
ベルギー	1 ゆりの球根であって検疫当局が指定した品種 2 種子で繁殖される球根ベゴニア(*Begonia tuberhybrida*)であって、播種後1作期間で収穫されるもの
南アフリカ	アマリリス属及びヒッペアストラム属の球根であって検疫当局が指定した容器に封入されたもの