Japan – Measures Affecting the Importation of Apples

(WT/DS245)

Answers of the United States of America
to Questions from Japan

November 13, 2002

1. While trans-oceanic dissemination of fire blight occurred from the United States (mainland) to New Zealand, United Kingdom, Egypt, and Hawaii, Japan recognizes that the causes of the trans-oceanic dissemination of fire blight have not been definitely identified with scientific evidence. On the other hand, the United States clearly denies not only the risk of transmission of fire blight via apple fruit in paragraphs 25 etc. of its first submission, but also the "circumstantial" evidence which shows that the dissemination of fire blight to the United Kingdom could be attributed to contaminated cargo crate of fruit in paragraph 61. Therefore, Japan presumes, with regard to the trans-oceanic dissemination of fire blight, that the United States has discovered some pathways based on scientific evidence. Please explain the pathways based on scientific evidence.

1. Japan's presumption that the United States has "discovered some pathways based on scientific evidence" is surprising; there is no need for discovery of new pathways when the scientific evidence contains numerous references to the transfer of *Erwinia amylovora* through infected nursery or propagative material.[1] Perhaps the most striking study was that of Calzolari *et al.* (1982).[2] Calzolari and his co-authors noted that Italy was fire blight-free but that there was a "continuous and massive importation of host plants, fruit trees and ornamental bushes" into Italy. They formed the hypothesis that "*E. amylovora* could be introduced into Italy and cause outbreaks of the disease" via this pathway. The authors tested their hypothesis by intercepting and sampling symptomless propagative material *from actual commercial shipments* of several fire blight hosts and indeed recovered the fire blight bacterium from buds of a 'Jonagold' apple tree, whose origin was a nursery in the Netherlands, in which fire blight was found as early as 1966. This result led them to conclude: "Our results have offered conclusive evidence to support the hypothesis that *E. amylovora* can be spread over great distances through the transport of apparently healthy plants." There are a number of additional reports of *E. amylovora* being isolated from asymptomatic pome fruit shoots (Crepel *et al.* (1996)),[3] buds (Bonn (1979)), Dueck & Morand (1975)),[4] or the development of fire blight, albeit at a low frequency, when scionwood

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[1] *See, e.g.*, S.V. Thomson, *Epidemiology of Fire Blight*, *in* Fire Blight: The Disease and Its Causative Agent, *Erwinia Amylovora*, at 14 (2000) (J.L. Vanneste, ed.) ("The evidence suggests there is potential for fire blight to be transported long distances in nursery trees.") (Exhibit USA-2); European and Mediterranean Plant Protection Organization (EPPO), *Data Sheet on Quarantine Pests:* Erwinia amylovora, Quarantine for Europe, at 4 (1997) ("The fireblight pathogen can mainly be transmitted over long distances by host plants which are latently infected or have undetectable cankers.") (Exhibit USA-5); T. van der Zwet, *The various means of dissemination of the fire blight bacterium,* Erwinia amylovora, EPPO Bulletin 24: 209-14, 212 (1994) ("The movement of contaminated budwood is most important in the spread of fire blight by man. This would be the most likely means of dissemination of the fire blight bacterium to the most isolated fruit-growing countries like Australia, Chile, and South Africa.").

[2] A. Calzolari *et al.*, *Occurrence of* Erwinia amylovora *in buds of asymptomatic apple plants in commerce*, Phytopathology 103: 156-62 (1982).

[3] C. Crepel *et al.*, *The latent survival of Erwinia amylovora in hibernating shoots*, Acta Horticulturae 411: 21-25 (1996).

[4] W. G. Bonn, *Fire blight bacteria in symptomless dormant apple and pear buds*, Can. J. Plant Pathol. 1: 61-62 (1979); J. Dueck & J.B. Morand, *Seasonal changes in the epiphytic population of Erwinia amylovora on apple and pear*, Can. J. Plant Sci. 55: 1007-1012 (1975).

from blighted trees was grafted onto new plants.[5] These and other papers provide scientific evidence relevant to all steps necessary for infected/infested nursery stock to serve as a pathway for the dissemination of fire blight over long distances.[6]

2. Finally, the United States must briefly comment on Japan's reference to four instances of trans-oceanic dissemination "from the United States (mainland)." The United States has reviewed the literature relating to each instance cited by Japan and finds that Japan has apparently misread the literature. First, Japan makes a factually incorrect statement asserting that fire blight has been disseminated to Hawaii from the mainland; the United States can find no records of, and knows of no unrecorded incidences of, fire blight in Hawaii. Second, the United States acknowledges the transmission of fire blight from the United States to New Zealand but notes that the literature states that this likely occurred via infected planting material (van der Zwet (1994)). Third, while there is a reference in the literature to dissemination of fire blight from the United States to Egypt *via nursery stock*, Japan may be aware that the author who made the initial report of fire blight suspected that imported nursery stock *from Europe* was the source (El-Helaly *et al.* (1964)), and a recent paper by Jock *et al.* (2002) reported that the distribution of strains inside Europe is consistent with a past dissemination of fire blight to Egypt from European locations. Finally, the United States notes that the attribution of spread of fire blight to England to putative contaminated U.S. fruit crates (Lelliot (1959)) is suspect as this paper clearly stated that it was equally likely that the disease was brought in on "*young trees, stocks, or budwood*" from the United States *or* New Zealand. The same Jock *et al.* (2002) study finds that the genetic fingerprints of *E. amylovora* strains in the United States, New Zealand, and Europe may suggest that New Zealand was the source of the spread of fire blight to England. Should Japan desire further information on the four instances of trans-oceanic dissemination to which it has referred, please see the U.S. answer to Question 23 from the Panel.

> *2. The United States asserts in paragraph 33 and footnote 67 of its first submission that the authors of van der Zwet et al. (1990) misidentified the symptoms of blighted apple fruit in storage experiment because the article has stated that "[i]nternal fruit blight symptoms were difficult to distinguish from other fruit rots". However, this article has clearly stated that "[a]fter 1 mo of storage, as much as 15% of the disinfested fruit blighted (presumably from endophytic bacteria" and that "[r]andom sampling from the surface of blighted fruit in storage resulted in recovery of E. amylovora", and the authors*

[5]T. van der Zwet *et al.*, *Occurrence of fire blight in commercial pear seedling rootstocks following budding with symptomless scionwood*, Phytopathology 73: 969 (1983) (Abstr.).

[6]*See, e.g.*, T. van der Zwet & J. Walter, *Presence of* Erwinia amylovora *in apparently healthy nursery propagating material*, Acta Horticulturae 411: 127-30 (1996); H.S. Aldwinckle & J. L. Preczewski, *Reaction of terminal shoots of apple cultivars to invasion by Erwinia amylovora*, Phytopathology 66: 1439 (1976); A. Burkowicz, *The appearance and current situation of fire blight in Poland*, EPPO Newsletter 72 E 3 (1972); W.G. Bonn, *Fire blight bacteria in symptomless dormant apple and pear buds*, Canadian Journal of Plant Pathology 23: 141-43 (1979).

have concluded that "asymptomatic fruit…may develop fire blight during commercial storage. How can the United States conclude that it was misidentification?

3. In the 1990 paper, Dr. van der Zwet clearly stated that he could not reliably differentiate the internal decay symptoms present in the fruit as being fire blight or fungal decay ("Internal fruit blight symptoms were difficult to distinguish from other fruit rots."). Therefore, his diagnosis of fire blight in stored fruit – in his words,"presumably" caused by endophytic bacteria – would have been validated *only* if: (1) the fruit were assayed for the presence of endophytic bacteria before storage and such bacteria were recovered and (2) the internal rots were assayed microbiologically and *E. amylovora* was isolated. Neither condition was satisfied according to the methods and experimental results described in the paper. That the authors isolated *E. amylovora* from the surface of some fruit is less in question than whether or not internal symptoms were fire blight and whether these symptoms developed because of endophytic *E. amylovora*.

3. The United States claims that the fruit in which endophytic Erwinia amylovora were detected in van der Zwet et al. (1990) were immature based on Dr. van der Zwet's Declaration (Exhibit USA-18) and Professor Thomson's letter (Exhibit USA-19) submitted by the United States as evidence of this case. However, how can you explain these statements?
(i) in van der Zwet et al. (1986), the same geographical survey, the authors state that the tested fruit were "[m]ature, apparently healthy."
(ii) Roberts et al. (1998), of which Dr. van der Zwet is co-author, states clearly that apple fruit harvested in Utah, West Virginia, Washington and Ontario in Table 4 of the van der Zwet et al. (1990) were mature and symptomless.
(iii) Professor Thomson had observed in Thomson (2000), that "[v]an der Zwet et al. (1990) recovered E. amylovora from inside mature apple fruit."

4. (i) The 1986 abstract is just that, an abstract, and the results are given with considerably more detail in the 1990 paper. A careful reading of this 1990 paper reveals that the fruit tested in the geographic experiment were not all mature, and the letter and declaration by the co-authors confirm this reading of the paper.

5. (ii) and (iii) Roberts *et al.* (1998) and Thomson (2000) are review papers and therefore are intended to survey the literature. Inaccurate reports on the findings in van der Zwet *et al.* (1990) cannot be used to establish a fact not supported by that paper, especially when efforts have been made to correct the errors of interpretation that have arisen from this work. For example, that Thomson (2000) cited van der Zwet *et al.* (1990) as having reported recovery of endophytic *Erwinia amylovora* from inside mature apple fruit was simply an error. Thomson (2000) wrote: "Van der Zwet *et al.* (1990) recovered *E. amylovora* from inside mature apple fruit only when it was grown within 60 cm of visible fire blight infections." These results, however, are presented in Table 3 in van der Zwet *et al.* (1990), which clearly indicates that the fruit in question were harvested in July and August 1986 and were therefore immature apple

fruit. Thus, Japan cannot cite to Thomson (2000) for support of Japan's assertion that van der Zwet *et al.* (1990) recovered endophytic *E. amylovora* from inside mature apple fruit. Dr. van der Zwet himself has confirmed the immature status of these fruit in his declaration.[7]

> *4. Regarding Dr. van der Zwet's Declaration (Exhibit USA-18) and Professor Thomson's letter (Exhibit USA-19),*
> *(1) When did the United States first contact Dr. van der Zwet and Professor Thomson in connection with van der Zwet et al. (1990)?*
> *(2) What specifically did the United States ask them to do? What were the questions? Can the United States provide the list of questions it asked?*
> *(3) Did the United States draft the Declaration and the letter? Did the United States make comment on them? How were the text of the Declaration and the letter developed?*
> *(4) Did either of them refuse to make any statement that the United States asked them to make? If so, what is it that they refuse to state?*

6. (1) - (4) The United States has presented to the Panel and Japan the relevant facts concerning the process which resulted in Dr. van der Zwet submitting his declaration and Professor Thomson submitting his letter for public use.[8] The authors did not "refuse to make any statement" because the United States did not *ask* them to make any particular statement. The declaration by Dr. van der Zwet and the letter by Professor Thomson recorded the answers given by the respective authors in response to questions posed by the United States. In the case of Professor Thomson, Japan could have confirmed this account – as well as Professor Thomson's understanding of the 1990 experiments – had Japan accepted Professor Thomson as an expert to advise the Panel. For its own reasons, Japan chose not to.

7. The co-authors of the van der Zwet *et al.* (1990) paper were quite willing to respond to requests for clarifications of their 1990 paper. Lamentably, Japan appears not to have asked for any clarification from the authors in the decade since its publication, instead relying on the self-evidently ambiguous presentation in the paper. Perhaps Japan did not seek clarification from the co-authors because it suspected that they would respond as they have: that is, that the recovery of endophytic bacteria reported in the 1990 van der Zwet *et al.* paper was, in every case, made from *immature* fruit. Thus, these experimental results do not provide relevant scientific evidence for the risk of introduction of fire blight through imported apple fruit, and Japan's reliance on these results is misplaced.

> *5. The United States states in paragraph 34 of its first submission that "[b]lossoms that become infected tend to abort their fruit, and any fruit became infected (either through movement of the bacteria through internal tissues from a canker to the fruit or through external wounding of the fruit) do not develop normally. Instead, they 'turn brown to*

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[7] *See* Exhibit USA-18.

[8] Closing Oral Statement of the United States, para. 7 (October 22, 2002).

black, shrivel and, like the blossoms, remain attached to the spur, taking on a mummified appearance.' Thus, while immature apple fruit may contain detectable levels of internal fire blight bacteria without yet having developed disease symptoms, by the time of harvest mature, symptomless apple fruit will not harbor internal populations of fire blight bacteria." Why does not E. amylovora exist inside mature apple fruit, while immature apple fruit can harbor E. amylovora? Please explain based on scientific evidence what is happening inside apple fruit during the process in which apples develop from immature fruit to mature one.

8. *Erwinia amylovora* does not exist in mature fruit because immature fruit that become infected with fire blight will not develop to maturity, but will "turn brown to black, shrivel and, like the blossoms, remain attached to the spur, taking on a mummified appearance."[9] Populations of *E. amylovora* that may contaminate moribund flower parts (calyx tissues) of immature fruit decline during the growing season (Dueck (1974), Hale *et al.* (1987)) and are rarely found (Hale *et al.* (1987)) or not found (Dueck (1974), Roberts *et al.* (1989)) at harvest. Endophytic *E. amylovora* has not been recovered from mature apple fruit at harvest (Dueck (1974), Roberts *et al.* (1989), van der Zwet *et al.* (1990), Roberts (2002)). Thus, the scientific evidence presented in these papers establishes that mature apple fruit do not contain internal populations of *E. amylovora* and are very rarely externally contaminated with bacteria. Given this evidence, as well as other scientific evidence establishing that imported apple fruit do not serve as a pathway for introduction of fire blight, we do not believe that Japan has identified any scientific evidence that supports its position that mature apple fruit pose a real risk of entry, establishment, or spread of fire blight disease within Japan.

6. The United States claims in paragraphs 42-45 of its first submission that there are neither mechanism nor vector that transmit E. amylovora to susceptible host plants of fire blight from imported apple fruit based on the experiments of Hale et al. (1996) and Hale & Taylor (1999). However, Japan considers that the results of the experiments in question have no scientific universality because they did not take following things into account.
In the experiment of Hale et al. (1996), Taylor et al. (2002)
(i) the fruit inoculated with E. amylovora in the calyx (inoculum source) did not seem to develop the symptom, exude bacterial ooze and produce bacterial strand, and
(ii) the experiment had been conducted in only one orchard and for only one year.
In the experiment of Hale & Taylor (1999),
(iii) the inoculated isolates were grown in Luria-Bertani (LB) broth, and survival ability of E. amylovora grown in LB broth is known to be remarkably low compared with the bacteria on naturally infected plants, such as the bacteria in ooze, etc.
And in both experiments,

[9]European and Mediterranean Plant Protection Organization (EPPO), *Data Sheet on Quarantine Pests:* Erwinia amylovora, Quarantine for Europe, at 1-4 (1997) (Exhibit USA-5).

(iv) the environmental conditions such as humidity were not taken into account. Please explain how the United States thinks about these limits of adaptation of the experiments?

9. As noted in Roberts *et al.* (1998): "There are no specific pathways recorded that document movement of *E. amylovora* from fruit, either imported or domestic in origin, to susceptible host tissues in an orchard or nursery." Indeed, the 1999 Japanese Pest Risk Analysis did not identify *any* scientific evidence of a vector or dispersal mechanism to move bacteria from imported fruit to a susceptible host. Thus, the New Zealand studies must be understood as efforts to provide experimental data where there is no biological evidence that a vector exists. In response to Japan's specific questions:

10. (i) What Japan apparently fails to understand is that if a plant part develops symptoms or sign (ooze, bacterial strand), it by definition is infected. With reference to fruit, this infection prevents development of fruit to maturity. Japan correctly observes that fruit inoculated with *E. amylovora* do not develop fire blight. This is because apple calyx tissue does not support multiplication of *E. amylovora* or subsequent infection and ooze production. Once again, Japan seeks experimental conditions that are not seen in nature.[10] Mature fruit with external contamination of *E. amylovora*, although very rare in actual experience, are the focus of the New Zealand studies cited in the question because any infected fruit would not develop to maturity or enter the commercial fruit handling process.

11. (ii) The experiment reported in Taylor *et al.* (2002) was essentially an expansion of other work reported earlier by Hale *et al.* (1996), and has also been repeated an additional year, with identical results. Therefore, contrary to Japan's assertion, there are at least *three* years of experimental data available confirming the absence of any vector to transfer bacteria from contaminated, discarded fruit to a susceptible host plant.

12. (iii) Japan appears to have erroneously cited to Hale & Taylor (1999), which did not study whether a dispersal mechanism or vector exists to transfer *E. amylovora* to a susceptible host plant from discarded apple fruit. Rather, this study (discussed in paragraph 40 of the U.S. first written submission) reported that the effect of normal commercial cool storage on infested apple fruit was to virtually eliminate bacteria inoculated even with extremely high levels of bacteria. Should Japan continue to desire information in response to its question, we would require that Japan provide a literature citation to support its assertion that *E. amylovora* survival in Luria-Bertani broth is "remarkably low" compared to that on plant surfaces.

13. (iv) Environmental conditions during the above studies were not within the control of the experimenters; this lack of environmental control is common to all field plot experiments. This is why multiple years of field data are preferable to data from a single year when drawing

[10] *See* U.S. Answer to Question 12 from Japan.

conclusions from experimental data. This preference has been satisfied with regard to these experiments demonstrating that there is no dispersal of bacteria from discarded, infested fruit, and the United States has no problem with the validity of the methods, results, or conclusions of the authors.

> *7. With regard to the necessity of buffer zone, Japan would like to know the reason why the United States recognizes the necessity for citrus canker, while it does not recognize the necessity for fire blight in paragraph 50 of its first submission.*

14. The United States has previously responded to Japan on the comparison between the U.S. position on buffer zones in the context of citrus canker and in the context of fire blight. The United States noted in a letter dated July 27, 1999, from Alan Green, U.S. Department of Agriculture, to Takeo Kocha, Ministry of Agriculture, Forestry, and Fisheries, that "Citrus Canker is a different disease. A buffer may be appropriate in one instance and not in another." The United States also directs Japan's attention to the U.S. answer to Question 32 from the Panel.

> *8. The United States seems to claim that the eradication or prevention of fire blight is easy, by stating in paragraph 81 of its first submission that "Japan apparently dismisses the possibility that the disease could be eradicated before spread, …….Japan also does not evaluate whether the disease, once established, could be prevented from spreading." If so, why does not the United States, by itself, try to eradicate or prevent fire blight at least in the States of Washington and Oregon?*

15. Japan's assertion that the United States considers eradication programs to be "easy" is groundless. The point of the quoted passage is that there is scientific evidence that eradication has, in some cases, been attempted and has been successful. Japan's failure even to acknowledge these efforts and results forms part of its overall failure to make a proper assessment of risks through an evaluation of the likelihood of entry, establishment, or spread. Obviously, fire blight disease is now endemic in the United States, to the point that it is beyond the scope of an eradication program. Even if a program were attempted, any efforts that would be made for this situation are far in excess of those needed to eradicate a small, localized infection such as might arise from the planting of an infected ornamental host tree imported from an infected nursery (similar to the recent Australian experience with fire blight). However, this Australian experience might be relevant to a country with a new, isolated experience of entry of fire blight. If the Australian or Norwegian experiences are *not* relevant, then Japan's pest risk assessment should have stated why. It does not.

> *9. In the Exhibit USA-14, it is indicated that the Republic of Korea does not take any measure against fire blight. However, Japan recognizes that the Republic of Korea prohibits the importation of apple fruit from fire blight occurring countries. On what basis does the United States assume, in its Exhibit, that the Republic of Korea does not take any measure against fire blight?*

16. Please see the U.S. answer to Question 24 of the Panel for an answer to this question.

> *10. The United States appears to claim that "mature" - not "mature, symptomless" apple fruit - do not transmit fire blight. Should we assume then that the United States has changed its position on the criteria that would offer security against the risk of the spread of the disease?*

17. No. Given the biological realities of the fire blight disease as established by the scientific evidence, the terms "mature" fruit and "mature, symptomless" fruit are two ways of saying the same thing as all mature fruit harvested from an orchard will be symptomless. The United States has chosen to use the more concise term for its submission.

> *11. In its response to a question of the Panel during the first substantive meeting, the United States claimed that the "commercial maturity" always precedes the "physiological maturity". What sort of evidence would the United States offer to substantiate this view?*

18. At the first substantive meeting of the Panel with the parties, the United States actually said the exact opposite of what Japan has written – that is, the United States said that commercial maturity always follows physiological maturity. In brief, "physiological maturity" refers to the stage of development when fruit will continue to develop and ripen even if detached from the plant whereas "horticultural" or "commercial" maturity refers to the stage of development when fruit possesses the attributes desired by consumers. For apples, commercial maturity comes when the fruit is fully developed, physiologically mature, and even ripe. Please refer to the U.S. answer to Question 19 from the Panel and the literature cited therein for precise definitions of these terms and their temporal relationship.

> *12. There are only two studies that sought to detect endophytic bacteria from inside mature apple fruit at a location severely affected by fire blight; i.e., Dueck (1974) and van der Zwet et al. (1990). The Dueck study was negative on 60 apple samples and van der Zwet was positive. Is it the United States' position that these results are sufficient to establish no bacteria will be detected in mature apple in all circumstances?*

19. Japan's question is very curious in light of the fact that it must be fully aware of the paper by Roberts *et al.* (1989), to which it has had full access since *before* its official publication. This paper also sought to determine if endophytic bacteria are present inside mature apple fruit and tested fruit harvested from two years (1987 and 1988) of severe fire blight in Washington State. Consistent with all of the other evidence, this paper did not recover *any* endophytic bacteria from 1,555 harvested mature apple fruit. Other papers also document the absence of internal *or* external bacteria from harvested mature apple fruit (save for some rare epiphytic detections in the most severe fire blight conditions).[11]

[11] *See* U.S. First Written Submission, paras. 33-37 (citing scientific evidence).

20. Japan remarkably continues to assert that van der Zwet *et al.* (1990) recovered endophytic bacteria from mature apple fruit, despite the express statements by the co-authors of that paper that, in fact, endophytic *E. amylovora* was only isolated from *immature* apple fruit. The United States directs Japan's attention to the numerous places in which we have provided a correct reading of that paper.[12] Therefore, there is more than enough scientific evidence, gathered over multiple years, in multiple geographic locations, and on numerous cultivars, which demonstrates that endophytic bacteria do not occur in mature apple fruit, even when harvested from severely blighted orchards and trees.

> *13. The United States claims that maturity of apple fruits can be defined with "OECD Scheme for the application of international standards for fruit and vegetables". OECD Scheme described judging maturity of fruit by the following methods.*
> *1) Determination of firmness of fruits by PENETROMETER.*
> *2) Determination of the starch content of apples and pears using an IODINE solution.*
> *3) Determination of the Total Soluble of sugar (TSS) by REFRACTOMETER.*
> *4) Determination of fruit acids by Titration and calculation of the sugar /acid ratio.*
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> *Which method of the OECD Scheme does the United States use to claim that Erwinia amylovora does not exist inside mature apple fruit? Moreover, please explain with scientific evidence why the United States can claim so.*

21. In the United States, three of the methods cited in the OECD standards are routinely used to evaluate commercial maturity: penetrometer readings (firmness), starch index, and soluble solids. These values indicate the fruit has reached commercial (horticultural) maturity. The scientific evidence establishes that *E. amylovora* is not present inside commercially mature fruit. For further information, please see the U.S. answers to Questions 3 and 19 from the Panel.

> *14. Can Japan regard the following statements in the first submission of the United States as simple mistakes?*
> *(i) With regard to "Rome Beauty" and "Delicious" apples harvested in State of Utah, footnote 68 of the U.S. submission states that "17 of 120 immature fruit were found to have internal populations [of fire blight bacterium.]" However, at Table 4 of van der Zwet et al. (1990), E. amylovora was detected from inside of 14 apple fruit harvested from the fire blight occurring orchard.*
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> *(ii) With regard to "York" and "Delicious" apples harvested in the State of West Virginia, footnote c. of the Table 4 of van der Zwet et al. (1990) has stated that "[f]orty fruit of each cultivar were collected from each blighted and healthy orchard," and the footnote 68 of the U.S. submission also states that "from West Virginia, U.S.A., 80 immature fruit*

[12] *See, e.g.*, U.S. First Written Submission, para. 33 & fn. 67, 68; U.S. Reply to Preliminary Rulings Request, paras. 2, 7, 8; Opening Oral Statement of the United States, paras. 16-19 (October 21, 2002).

and 80 mature fruit were found to be free of internal fire blight bacteria." Thus, it is considered that total 160 fruit were used in the experiment. On the other hand, footnote 80 of the U.S. submission states that "[f]rom West Virginia, U.S.A., epiphytic bacteria were found on 3 out of 80 immature fruit from 'healthy' orchards and 2-4 (the actual number is not presented) out of 80 immature fruit from severely blighted orchards, but epiphytic bacteria were not recovered from 80 mature fruit" and we can calculate that the number of total tested fruit was 240.

(iii) With regard to "Delicious" apples harvested from a blighted orchard in the State of Utah, because van der Zwet et al. (1990) has stated that "Fruit of Delicious were collected from branches on healthy trees located 1-2 m from severely blighted Jonathan trees", Japan considers that those apple fruit were harvested from healthy trees. However, footnote 80 of the U.S. submission states "[f]rom Utah, U.S.A.,…all positive detections were made on fruit harvested from blighted trees in severely orchards" and the paragraph 3 of Professor Thomson's letter, Exhibit USA-19, also states that "[t]his [Delicious] fruit was harvested from a blighted (2-4 strikes) in a severely blighted orchard." Those statements regard those apples as harvested from blighted trees.

22. (i) In footnote 68 of the U.S. first written submission, the United States reported that "17 of 120 *immature* fruit were found to have internal populations" when harvested from Utah; the reference should read "7-14 out of 120 immature fruit."

23. (ii) In footnote 80 of the U.S. first written submission, the United States reports that "epiphytic bacteria were found on 3 out of 80 *immature* fruit from 'healthy' orchards and 2-4 (the actual number is not presented) out of 80 *immature* fruit from severely blighted orchards, but epiphytic bacteria were not recovered from 80 mature fruit" harvested in West Virginia. The reference should read "3 out of 40 *immature* fruit from 'healthy' orchards and 2-4 (the actual number is not presented) out of 40 *immature* fruit from severely blighted orchards"; the reference to no epiphytic bacteria being recovered from 80 mature fruit, even when harvested from a severely blighted orchard, is correct.

24. (iii) Japan accurately quotes van der Zwet *et al.* (1990) to say "Fruit of Delicious were collected from branches on healthy trees located 1-2 m from severely blighted Jonathan trees," only leaving out the concluding phrase "with more than 200 blighted shoots per tree." Professor Thomson has explicitly stated in his letter, moreover, that the Delicious fruit harvested in September 29, 1986, from which a calyx detection was made, "was harvested from a blighted tree (2-4 strikes) in a severely blighted orchard (adjacent Rome trees had 50-100 strikes per tree)."[13] Thus, it is not clear that the Delicious fruit were harvested from "healthy trees." It is

[13]Letter from S.V. Thomson, Utah State University, to R.G. Roberts, U.S. Department of Agriculture, at 1 (August 23, 2002) (Exhibit USA- 19).

clear, however, that these Delicious fruit were harvested in close proximity to severely blighted trees in a severely blighted orchard.

> *15. Can Japan regard following quotations in the U.S. Submission as simple mistakes?*
> *(i) An article "Survival studies with the fire blight pathogen Erwinia amylovora in soil and in a soil-inhabiting insect" written by M. Hildebrand et al. is quoted as the footnote of the statement in paragraph 45 of the U.S. submission "hypothetical fire blight bacteria would be subject to predation (that is, being consumed by other organisms)." However, while the context of the U.S. submission discusses an event "on the soil," the article quoted in the footnote discusses an event "in the soil." Therefore, they are inconsistent with each other.*
> *(ii) In footnote 149 of paragraph 75 of the U.S. submission, the United States regards Sholberg et al. (1998) as study on isolation of E. amylovora from "apple leaves", however, in this article they seem to have isolated the bacteria from "apple fruit".*

25. (i) A hypothetical population of *E. amylovora* on discarded fruit would be susceptible to the negative effects of predation (that is, being consumed by other organisms), microbial antibiosis (the production of antibiotics that inhibit reproduction or survival of fire blight bacterium), or competition, whether deemed to occur "in" the ground or "on" the ground. In either case, the fruit would be exposed to interaction with soil biota upon discard.

26. (ii) The United States did note at paragraph 35 of the U.S. first written submission that the Sholberg *et al.* (1988) paper also tested mature fruit for epiphytic bacteria. The reference in footnote 149 to this paper could have read "apple leaves as well as apple fruit." Nonetheless, the point remains the 1999 Japanese Pest Risk Analysis failed to evaluate the likelihood of contamination of mature fruit with *E. amylovora* through a careful appraisal of the scientific evidence, including drawing distinctions between findings in the literature that were relevant and irrelevant to its assessment of risks. Japan continues to make this fundamental error when it focuses on results from van der Zwet *et al.* (1990) that relate to immature fruit.

> *16. Although Japan requested, in October 2001, the United States to offer data on five issues such as the situations of occurrence of fire blight in Washington and Oregon States, the difference between the two States and other States in terms of occurrence of fire blight, etc. to supplement the results of the joint study of 2000 because the results of the joint study were not enough to examine the relaxation of Japan's current measure, the United States has offered none of them so far. Are you willing to submit these data, if the answer is yes, when will it offer these data to Japan?*

27. For further information, please see the U.S. answer to Question 28 from the Panel.