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COMMISSION ON PHYTOSANITARY MEASURES

Third Session

Rome, 7 - 11 April 2008

Comments on draft standards (CPM 2008/2 - Annex 3) Methodologies for sampling of consignments

Agenda Item 9.2 of the Provisional Agenda

Document by the IPPC Secretariat

1. The Secretariat compiled comments received in advance of the CPM on the draft ISPM on methodologies for sampling of consignments from the following members and RPPOs:

- Argentina
- Australia
- Bolivia
- Brazil
- Chile
- COSAVE
- EC and its Member States
- EPPO
- Japan
- Norway
- Paraguay
- Republic of Korea
- USA
- Uruguay

Advanced comments prior to CPM-3 on Annex 3 of CPM 2008/2

DRAFT ISPM: METHODOLOGIES FOR SAMPLING OF CONSIGNMENTS

The following are comments received as of 04 April 2008 according to guidelines given in the document CPM 2008/2. The Secretariat has compiled the comments, as provided by members, in the order of the text.

	1. Section	2. COUNTRY	3. Type of comment	4. Location	5. Proposed rewording	6. Explanation
1.	***GENERAL COMMENTS***	Japan	General comments		The description regarding relation between statistically based sampling methods and heterogeneous distribution pattern of pests may not seem to be sufficiently appropriate. The spatial distribution of pests may be aggregated in a consignment and infected units may not be distributed at random within the consignment. However, if we draw sampling units at random from the consignment, the distribution of the number of infected units in the sample follows distributions such as hypergeometric distributions, which means that we can statistically obtain the required sample size irrespective of the heterogeneous distribution of pests by random sampling. In principle, statistically based sampling of consignments should be based on random sampling and this standard should make clear this point. Furthermore, considering implementation of this standard, impractical method such as sampling with beta-binominal distribution should not be included.	
2.	***SPECIFIC COMMENTS***	Australia	Editorial	Through out document	Replace 'statistically based methods' with '**statistical sampling**' Replace 'non-statistically based sampling' with '**non-statistical**'	Better terminology
3.	OUTLINE OF REQUIREMENTS	European Commission and its member states (hereafter "EC")	Technical	First para, last sentence	Delete "tolerance level" to read: ".. These include parameters such as acceptance level, level of detection, confidence level, efficacy of detection and sample size."	Consistency with our comments on 3.1.1 and 3.1.2. "Tolerance level" is not a parameter.
4.	OUTLINE OF REQUIREMENTS	Australia	editorial	Para 2, sentence 1	~~Other sampling methods that are not statistically based~~ **Non-statistical sampling methods**, such as convenience sampling, haphazard sampling or selective sampling, may provide ~~valid~~ results in determining the presence or absence of a regulated pest(s) ~~but no statistical inference can be made on their basis~~ **which cannot be generalized beyond the sample**.	Better terminology
5.	OUTLINE OF REQUIREMENTS	EC, EPPO	Technical	Last para, last sentence	Delete	Present wording is incoherent with that of Sect 7; and idea of Sect 7 is only marginal to the scope of this ISPM
6.	**BACKGROUND**	EC, EPPO	Technical	Para 2, sentence 2	"…may also apply to **other** phytosanitary procedures…"	Inspection of consignment is a PS procedure

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7.	**BACKGROUND**	Australia	Editorial	Para 4 sentence 1	… based on sampling may lead to **the** refusal to issue	
8.	**BACKGROUND**	Australia	Editorial	Para 4 sentence 1		Re-export? ISPM 20 section 5.1.6.1
9.	**BACKGROUND**	Australia	Editorial	Para 5 sentence 1	…and may be solely statistical~~ly based~~ or developed noting particular operational constraints	Better terminology
10.	**BACKGROUND**	USA	Editorial	Para 5 sentence 2	**"…still give acceptable results depending on ….**	
11.	**BACKGROUND**	Australia	substantive	Para 5, sentence 2		It would be possible to devise a sound statistical sampling method taking these constraints into account.
12.	**BACKGROUND**	Australia	substantive	Para 5, sentence 3	..selective or targeted sampling **where know of hotspots.**	This is correct only if we have prior knowledge of the hotspots
13.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	USA	Technical	2nd indent	**"- provide assurance that the number of regulated pests or infested units in a consignment does not exceed the specified tolerance level for the pest"**	
14.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	EC, EPPO	Editorial	First para, first sentence	Change "and" to "and**/or**"	As in sect 3
15.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	Australia	editorial	Para 2, sentence 1	always involves a degree of ~~error~~ **uncertainty.**	Better word
16.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	Australia	editorial	Para 2, sentence 2	The acceptance of some probability that the pests are present is inherent in the use of ~~sampling procedures~~ **statistical sampling methods** for inspection and/or testing.	Better description
17.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	EC, EPPO	Technical	Last para, last sentence	"…sampling methods **provides a level of** confidence that the incidence of a pest…"	To stress that this is about confidence in a statistical sense, not in a general sense. Also it is a fact that statistical based methods always provide a confidence level, not only 'can provide'
18.	**OBJECTIVES OF SAMPLING OF CONSIGNMENTS**	USA	technical	Last paragraph, last sentence	**"Inspection and/or testing using statistically based sampling methods can provide a known level of confidence that the incidence of a pest is below a certain level, but it does not prove that a pest is truly absent from a consignment."**	
19.	**1. Lot Identification**	Australia	Editorial	Para 2	A lot to be sampled should ~~be~~ **have** a number …	
20.	**1. Lot Identification**	USA	technical	Last paragraph	**"A sample taken from a lot is valid for making statistical inference at a given level of detection.**	The previous statement was vague and probably incorrect. If the sample is

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					Treating multiple commodities as a single lot for convenience…	selected correctly, we can always make an inference to the lot or consignment.
21.	**2. Sample Unit**	Australia	Editorial	Whole section	Replace 'sample unit' with 'sampling unit'	
22.	**2. Sample Unit**	EC, EPPO	Editorial	First sentence	Change "bouquet" to "**bunch**"	In line with 3.1.3.5
23.	**2. Sample Unit**	USA	technical	Add new second sentence	**"Sample units should be consistently defined and independent from each other or mutually exclusive. This property simplifies the process making inferences from the sample to the lot or consignment from which the sample was selected. The determination….**	Including this statement allows sample units to be defined so that simple sample design can be used. Without this statement, theory presented in the appendices is questionable, if not incorrect.
24.	**3. Statistical and Non-Statistical Sampling**	EC, EPPO	Technical	First para, last sentence	"NPPOs may choose either a statistically or **non-statistically** based sampling methodology"	This chapeau should reflect that distinction; targeted sampling is only one of several non-statistical methods
25.	**3. Statistical and Non-Statistical Sampling**	Australia	Editorial	Para 1, sentence 3	Sampling based on statistical or ~~targeted methods~~ **non-statistical sampling** is designed to facilitate the detection of a regulated pest(s) in a consignment and/or lot	
26.	3.1 Statistically based sampling	USA	technical	Add at the end of the paragraph	**"Each member of the lot or consignment must have a positive quantifiable chance of being included in the sample."**	Improve definition
27.	3.1 Statistically based sampling	Japan	Substantive	Add new para after para. 1.	When the following methods are used, sampling units should be drawn at random from each consignment or lot. Random sampling yields the same distribution of the number of infected units irrespective of the distribution pattern of pests within the consignment or lot. The problem of unknown heterogeneity is thus solved by the randomization.	This section should make clear the basic principle that the statistically based sampling methods should be based on random sampling, which is effective regardless of pest distribution pattern (e.g. aggregated). Our understanding is that random sampling is the basic premise of "hypergeometric distribution", which is, under certain conditions, approximated by "binominal distribution" or "Poisson distribution". *Hypergeometric distribution;* There is a consignment of N units in which M are infected units. You draw n units from the consignment at random without replacement. In this situation, the hypergeometric distribution describes the probability that exactly k

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						units are infected units in a sample of n distinctive units drawn from the consignment. If samples are drawn n units from the consignment at random without replacement from finite population which includes M infested units, then probability of infected units in each sample is the hypergeometric distribution. Therefore, it is not necessary to draw a sample from a consignment in which the pest is randomly distributed. When N becomes large in p=M/N, then the hypergeometric distribution can be approximated by binomial distribution. When p=M/N is small and n is large, then hypergeometric distribution can be approximated by Poisson distribution.
28.	3.1.1 Parameters	EC	Technical	Title	Change to "Parameters **and related concepts**"	"Tolerance level" is not a parameter. The title should reflect it. (see comment to 3.1.2 para 1)
29.	3.1.1 Parameters	Rep. Korea	substantial	Sent 1	Statistically based sampling is designed to detect a certain percentage or proportion of infestation with a specific confidence level, and thus requires the NPPO to determine the following interrelated parameters: acceptance number, level of detection, confidence level and efficacy of detection, ~~sample size~~. The NPPO may also establish a tolerance level for certain pests (e.g. regulated non-quarantine pests).	Sample size may not be parameter
30.	3.1.1 Parameters	Australia	Editorial	Para 1	(~~e.g.~~**for example** regulated non-quarantine pests)	
31.	3.1.1 Parameters	USA	technical	Add a last sentence	**"Following this process and using a properly selected sample, the NPPO is able to make an inference from the sample about the lot or consignment"**	Clarify purpose and application
32.	3.1.1.1 Acceptance number	EC	Editorial	First para, sentence 4	Change "mean" to "imply"	More precise.
33.	3.1.1.1 Acceptance number	USA	editorial	First paragraph, last sentence	**"Even if no pests are detected in the sample, there remains a probability that the pest may be present in the remainder of the consignment, albeit at a very low**	

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					level."	
34.	3.1.1.2 Level of detection	EC, EPPO	Editorial	Para 1	"…and level of confidence, **and** which the NPPO intends to detect…"	To make clear that 'which' refers back to level of detection, not to level of confidence
35.	3.1.1.2 Level of detection	EC, EPPO	Editorial	Para 2, last indent	Insert "…inspection **intensity** above…"	More precise. Current text could be misinterpreted as '…inspection above 2 m from ground level…'
36.	3.1.1.3 Confidence level	USA	Technical	Add a new 3rd sentence	**"The accepted statistical practice is to set the level of confidence and then adjust the acceptance level or sample size to meet the NPPO's needs. The NPPO may choose…"**	Document the correct statistical approach for sample design.
37.	3.1.1.5 Sample size	Australia	Substantive	New dash point	The sample size is the number of units selected from the lot or consignment that will be inspected or tested. **- Guidance on determining the sample size is given in Section 5 of this ISPM.**	
38.	3.1.1.6 Tolerance level	EC	Substantive	Para 1, sentence 2	Delete the second sentence	We note that the relationship between Tolerance Level and Level of Detection is also dealt with in 3.1.2 para 2. We suggest dealing with the matter twice seems superfluous and potentially confusing, and suggest therefore the deletion in this position.
39.	3.1.1.6 Tolerance level	Norway	technical	Para 1, sentence 2	Delete	Relationship between tolerance level and level of detection is also dealt with in 3.1.2. See also comment on 3.1.2, para 2
40.	3.1.1.6 Tolerance level	EPPO	Substantive	Para 1, sentence 2	Add at the end: "…tolerance level **when above zero**". Move that entire sentence to become a new, last para. (However, we note that the relationship between Tolerance Level and Level of Detection is also dealt with in 3.1.2 para 2. We suggest dealing with the matter twice seems superfluous and potentially confusing, and suggest it be considered to delete from one of the positions)	If the tolerance level is set to zero, setting also the detection level to zero would imply that every single unit (every plant, every leaf…) would have to be inspected, which is obviously not realistic. The relationship between the two parameters is better placed as a conclusion of the section, after the description of how tolerance level may be set. **(NOTE: the repetitiveness question**

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						for steward consideration !)
41.	3.1.1.6 Tolerance level	EC, EPPO	Editorial	Para 3 sentence 1	Change "components" to "**units**"	To use the term used in the referred 3.1.1.1
42.	3.1.2 Links between the Parameters	EC	Technical	Title	Change to "Links between the Parameters and the Tolerance Level"	"Tolerance level" is not a parameter. The title should reflect it. (see comment to 3.1.2 para 1)
43.	3.1.2 Links between the parameters	EC, EPPO	Technical	Para 1	Change to: "The **five** parameters (acceptance number, level of detection, confidence level, efficacy of detection and sample size) are statistically related. **Taking into account the established tolerance level** , the NPPO should determine...in the sample; any two of the remaining **three** parameters...."	Setting the tolerance level is a regulatory decision based upon the PRA stage 3 and thus taken prior to any considerations regarding inspection and sampling, cf. ISPMs 16 and 21. Thus, as also indicated in Sect 3.1.1, the tolerance level is not a parameter 'in play' for the sampling designer; it is only for him/her to take into account (because it affects the calculation complex)
44.	3.1.2 Links between the parameters	Bolivia, Brazil, Chile, COSAVE, Paraguay, Argentina, Uruguay	Substantial	Para 1	The six five parameters (acceptance number, level of detection, confidence level, efficacy of detection, sample size and tolerance level) are statistically related. The NPPO should determine the efficacy of the detection method used and decide upon the acceptance number in the sample; any two of the remaining three four parameters can also be chosen, and the remainder will be determined from the values chosen for the rest.	There are only five statistically related parameters. The tolerance level is not statistically related to the five others, but it is a product of a PRA.
45.	3.1.2 Links between the parameters	Norway	technical	Para 1	(rephrase)	The para should be rephrased to reflect that tolerance level (often zero for QP) would normally be a pre-set value for regulated pests and not a figure deduced from the process of establishing sampling regimes, as may be the case with some of the other parameters.
46.	3.1.2 Links between the parameters	Australia	Editorial	Para 1, sent 1	…tolerance level) are ~~statistically~~ **inter-**related.	
47.	3.1.2 Links between the parameters	Norway	substantive	Para 2	(rephrase)	It is not clear what this mean in case of a zero tolerance.
48.	3.1.2 Links between the parameters	EPPO	Substantive	Para 2	Change to: "If a tolerance level **greater than zero has been established**, the level of detection …"	If the tolerance level is set to zero, setting also the detection level to zero would imply that every single unit

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					(However, we note that the relationship between Tolerance Level and Level of Detection is also dealt with in 3.1.1.6 para 2. We suggest dealing with the matter twice seems superfluous and potentially confusing, and suggest it be considered to delete from one of the positions)	(every plant, every leaf…) would have to be inspected, which is obviously not realistic. We propose deletion of 'based on risk analysis', as it seems superfluous and confusing to repeat was has just been stated in sect 3.1.1.6 para 2 (implicitly by ref. To ISPM 21 sect 4.1) and para 3 (explicitly). **(NOTE: the repetitiveness question for steward consideration !)**
49.	3.1.2 Links between the Parameters	EC	Substantive	Para 2	Change to: "If a tolerance level **above zero has been established**, the level of detection …"	If the tolerance level is set to zero, setting also the detection level to zero would imply that every single unit (every plant, every leaf…) would have to be inspected, which is obviously not realistic. We propose deletion of 'based on risk analysis', as it seems superfluous and confusing to repeat was has just been stated in sect 3.1.1.6 para 2 (implicitly by ref. To ISPM 21 sect 4.1) and para 3 (explicitly).
50.	3.1.3 Statistically based sampling methods	Australia	editorial	Para 1, sentence 1	Simple random sampling involves drawing the ~~sample units in accordance with a tool such as a random numbers table~~ **sampling units at random using a too**l.	
51.	3.1.3 Statistically based sampling methods	Australia	editorial	Para 1, sentence 2	The use of a predetermined **objective/**randomization	
52.	3.1.3.1 Simple random sampling	USA	Technical	Para 1, add sentence at the beginning	**"Simple random sampling is a sampling process where all possible sample selections of size n have an equal chance of being selected from a lot or consignment."**	Add definition
53.	3.1.3.1 Simple random sampling	USA	technical	Para 2	**"This method is used when little is known about the pest distribution or rate of infestation. Simple random sampling is difficult to apply correctly. To use this method, each unit should have an equal probability of selection. Random sampling may require greater resources than other sampling alternatives. The practical application is dependent on the type and/or**	Clarify and apply. The deleted sentence is imprecise and misleading. The word "often" is deleted because this method is difficult to apply correctly and rarely done correctly.

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					configuration of the consignment."	
54.	3.1.3.2 Systematic sampling	Japan	Substantive	Para. 1	Systematic sampling involves drawing a sample from units in the lot at fixed, predetermined intervals. However, the first selection must be made at random~~, and the assumption is made that the pest is randomly distributed~~ through the lot. Biased results are possible if the probability of infection changes cyclically with a cycle that is identical to m^1.~~pests are not randomly distributed. Such biases may be reduced when consignments have been subjected to grading, sorting and mixing during the packing process.~~	Systematic sampling is statistically appropriate methods to use for sampling of consignment irrespective of the distribution pattern of pests in the consignment. Not aggregation but particular cyclicity results in biases in systematic sampling.
				Add footnote	[1] We can determine using following calculation: m=population size(M)/sample size(n)	It could be useful information.
55.	3.1.3.3 Stratified sampling	USA	Technical	1st paragraph, 1st sentence	**"Stratified sampling involves dividing or grouping the lot into separate subdivisions (that is, strata) and then drawing some of the samples from each and every subdivision. Within each…"**	Clarification
56.	3.1.3.3 Stratified sampling	Australia	Editorial	Para 1, sentence 1	…and then drawing some of the sample~~s~~ **units** from each subdivision	Change samples to sample units
57.	3.1.3.4 Sequential sampling	Australia	Editorial	Para 1, sentence 1	Sequential sampling involves drawing ~~a series of~~ **sequential** samples using one of the above methods.	Change from samples to sample units in both sentences
58.	3.1.3.4 Sequential sampling	Australia	editorial	Para 1 both sentences	sample units	Change 'samples' to 'sample units' in both sentences
59.	3.1.3.4 Sequential sampling	USA	technical	2nd paragraph, 1st sentence	**"This method can be used when an acceptance level greater than zero is determined…"**	Correct inconsistent use of the term.
60.	3.1.3.5 Clustered sampling	Australia	Editorial	Title and Para 2, sentence 1	~~Clustered~~ **Cluster** sampling	
61.	3.1.3.5 Clustered sampling	USA	Technical	1st paragraph	**"Clustered sampling involves selecting groups of units based on a predefined cluster size (for example, boxes of fruit, bunches of flowers) to make up the total number of sample units required from the lot. Cluster sampling is easier to evaluate and more reliable if the clusters are of equal size. It is useful if resources available for sampling are limited and works best when the distribution of pests is expected to be random."**	Clarification
62.	3.2.2 Haphazard sampling	USA	Editorial	Replace 2nd and 3rd sentences	**"This should not be confused with random sampling. The inspector may inadvertently introduce selection**	Less confusing wording

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					bias, so the degree to which the sample is representative of the lot is unknown."	
63.	3.2.3 Selective or targeted sampling	Australia	substantive	Para 1, sentence 1		'parts of the lot most likely to be infested' - only if we have prior knowledge
64.	3.2.3 Selective or targeted sampling	USA	Technical	Add new sentence at the end	**"Selective or targeted sampling limits the opportunities to discover new information about the pest, because the focus of attention is where we expect to find pests.**	
~~65.~~	~~5.3~~ 3.2.4 Fixed proportion sampling	Bolivia, Brazil, Chile, COSAVE, Paraguay, Argentina, Uruguay	Technical	Entire paragraph [move 5.3 to 3.2.4]	Sampling a fixed proportion of the units in the lot (for example, 2%) results in inconsistent levels of detection or confidence levels when lot size varies. As shown in Appendix 4, fixed proportion sampling results in changing confidence levels for a given level of detection, or in changing levels of detection for a given confidence level.	This is a method for sampling rather than a sample size. This paragraph has been repositioned.
66.	**4. Selecting a Sampling Method**	EC	Editorial	Para 1 first sentence	Change "the pest´s incidence" to "pest incidence"	More precise as more than one pest is being considered..
67.	**4. Selecting a Sampling Method**	EC, EPPO	Technical	Para 3 first sentence	Change to "If sampling…a specific pest, targeted sampling (described in section 3.2.**3**) may be…	Not more than one targeted sampling method is described
68.	**4. Selecting a Sampling Method**	USA	Editorial	Para 3, sent 3	**"Targeted methods are designed to bias the chances of finding certain pests, so these non-probability methods do not allow the application or quantification confidence level and level of detection values chosen by the NPPO."**	This statement was patently misleading. It implied that confidence level and detection level could be calculated from a targeted non-probability sample. It is invalid and inappropriate.
69.	**4. Selecting a Sampling Method**	Australia	editorial	Para 3, sent 3		Should be noted that this cannot be qualified
70.	**4. Selecting a Sampling Method**	EC	Editorial	Para 3 last sentence	Change "Targeted methods" to "Targeted sampling methods"	To be more precise.
71.	**4. Selecting a Sampling Method**	EC, EPPO	Editorial	Para 3 last sentence	Delete "also"	Superfluous & confusing
72.	**4. Selecting a Sampling Method**	EPPO	Editorial	Para 3 last sentence	Change "chosen" to "**sought**"	'sought' would better than 'chosen' reflect that those levels in the end are maybe not being obtained
73.	**4. Selecting a Sampling Method**	EC	Editorial	Para 3 last sentence	Change "chosen" to "**sought**" (Targeted **sampling** methods do not result in each unit having an equal probability of being included in the sample, so the true confidence level and level of detection	'sought' would better than 'chosen' reflect that those levels in the end are maybe not being obtained

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					may not be equal to the values **sought** by the NPPO.)	
74.	**4. Selecting a Sampling Method**	USA	Editorial	Para 4	**"Statistically based methods will be appropriate if sampling is undertaken to provide information about the general phytosanitary condition of a consignment, to detect multiple quarantine pests or to verify compliance with phytosanitary requirements."**	Better wording
75.	**4. Selecting a Sampling Method**	Australia	Substantive	Para 7, sentence 2	…or suspected infestation due to the inspection or test results)	What does this mean?
76.	**5. Sample Size Determination**	EC	Technical	First para, first sentence	Change "efficacy of inspection or testing" to "efficacy of detection"	To use the term (3.1.1.4) consistently
77.	**5. Sample Size Determination**	USA	editorial	Last sentence	**"Appendices 1-5 set out the mathematical basis for sample size determination.**	
78.	5.1 Pests distributed randomly in the lot	Australia	Editorial	Section		Move text to stat based sections
79.	5.1 Pests distributed randomly in the lot	Australia	Editorial	Title	~~Pests distributed randomly in the lot~~ **Random distribution of pests**	
80.	5.1 Pests distributed randomly in the lot	Japan	Substantive	Title	**Pests distributtioned unknown~~randomly~~ in the lot**	This section mentioned simple random sampling method which statistically appropriate to use for sampling of consignment irrespective of the distribution pattern of pests in the consignment.
81.	5.1 Pests distributed randomly in the lot	Japan	Substantive	Add after Para 1, sentence 1	Because sampling is **drawn at random** without replacement and the population size is finite,	Drawing sample at random in the lot is the most important factor of simple random sampling. Thus, it should be clearly mentioned here. Even if the distribution of infested units in the lot is not random, the distribution of the number of infected units drawn by random sampling follows the hypergeometric distribution. This is the basic principle of statistics, which is mentioned in most statistics texts.
82.	5.1 Pests distributed randomly in the lot	USA	Editorial	Para 2, last sentence	**"…detection levels with large lot sizes, but binomial and Poisson…"**	
83.	5.2 Pest distribution aggregated in the lot	Australia	Editorial	Title	~~Pest distribution aggregated in the lot~~ **Aggregated distribution of pests**	
84.	5.2 Pest distribution	Japan	Substantive	section	Delete this section	This standard should not include

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	aggregated in the lot					methods which are not practical for general use. The calculation of sample size using a beta binominal distribution requires the degree of aggregation. However, it is generally difficult to obtain it. If this section would be retained, explanation as to how the degree of aggregations can be obtained should be described.
85.	5.2 Pest distribution aggregated in the lot	EC	Editorial	First para, fifth sentence	Change "detection efficacy" to "efficacy of detection"	To use the term (3.1.1.4) consistently
86.	5.3 Fixed proportion sampling	Australia	Editorial	Section		Move to stat based section
~~87.~~	~~5.3 Fixed proportion sampling~~	Bolivia, Brazil, Chile, COSAVE, Paraguay, Argentina, Uruguay	Technical	Entire para	~~Sampling a fixed proportion of the units in the lot (for example, 2%) results in inconsistent levels of detection or confidence levels when lot size varies. As shown in Appendix 4, fixed proportion sampling results in changing confidence levels for a given level of detection, or in changing levels of detection for a given confidence level.~~	Relocated paragraph. This is a method for sampling and not a sample size.
88.	5.3 Fixed proportion sampling	USA	technical	Sent 1	**"Sampling a fixed proportion of the units in the lot (for example, 2%) results in inconsistent levels of detection when lot size varies."**	Detection levels vary but confidence levels are set and held constant.
89.	**6. Varying Level of Detection**	USA	technical	Whole section	**Delete**	Confusing when compared to other parts of the standard**.**
90.	**6. Varying Level of Detection**	EC	Editorial	para 1, sentence 3	Change "detection level" to "level of detection"	To use the term (3.1.1.2) consistently
91.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	Australia	Editorial	Title	Calculating sample sizes for small lots: hypergeometric-**distribution** based sampling (random sampling)	
92.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	Japan	Substantive	title	CALCULATING SAMPLE SIZES FOR SMALL LOTS: HYPERGEOMETRIC-BASED SAMPLING (SIMPLE RANDOM SAMPLING)	Accuracy

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93.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	USA	Technical	1st paragraph, add a new last sentence	**Hypergeometric sampling is based on sampling without replacement.**	This is an important concept.
94.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling	EC	Technical	Third para, A explanatory text under the formula	Change "efficacy of the inspection method or test" to "efficacy of detection"	To use the term (3.1.1.4) consistently
95.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	Japan	Substantive	After para. 5	Add new paragraph as follow; The number of sampling units can be given approximately by a following formula: $n \approx \left(N - \frac{Np-1}{2} \right)\left(1-\beta^{1/(Np)}\right)$, where β is the consumer's risk, i.e., the specified probability of false acceptance.	Although the formula is an approximation, how to calculate the sample size should be provided because NPPO personnel cannot calculate sample size except for those described in the Table 1.
96.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling	EC	Editorial	Table 1 description	Change "detection levels" to "levels of detection"	To use the term (3.1.1.2) consistently
97.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling	EC	Technical	Table 1 header row (cells 2 and 3)	Change "efficacy of inspection or test" to "efficacy of detection"	To use the term (3.1.1.4) consistently
98.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	USA	Editorial	1st paragraph under the table	**Values in the table are marked….**	
99.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-	EC, EPPO	Editorial	Text below Table 1, Para 1, first three sentences	Change to: "*) **The value has been rounded down to a whole number, as scenarios resulting** in a fraction of a unit being infested (for example 300 units with 0.5% infestation corresponds to 1.5 infested units in the	Clarity and simplification

	1. Section	2. COUNTRY	3. Type of comment	4. Location	5. Proposed rewording	6. Explanation
	based sampling (random sampling)				shipment) **are not possible**. This means that the sampling intensity…"	
100.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	EC, EPPO	Editorial	Text below Table 1, Para 2	Change to: "**Table cells** marked with a dash (-) **refer to** scenarios that are not possible (less than one unit infested)	Clarity and simplification
101.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	USA	Editorial	2nd paragraph under the table	**Values in the table are marked….**	
102.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling	EC	Editorial	Table 2 description	Change "detection levels" to "levels of detection"	To use the term (3.1.1.2) consistently
103.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling	EC	Technical	Table 2 header row (cells 2 and 3)	Change "efficacy of inspection or test" to "efficacy of detection"	To use the term (3.1.1.4) consistently
104.	**APPENDIX 1** Calculating sample sizes for small lots: hypergeometric-based sampling (random sampling)	Australia	Editorial	Table 2	Insert explanation of * and -	each table should stand alone, therefore give explanation of symbols
105.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based sampling	Australia	editorial	Title	Sampling of large lots: binomial or Poisson **distribution** based sampling	
106.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based	Japan	Substantive	title	SAMPLING OF LARGE LOTS: BINOMIAL OR POISSON BASED SAMPLING (SIMPLE RANDOM SAMPLING)	Accuracy

	1. Section	2. COUNTRY	3. Type of comment	4. Location	5. Proposed rewording	6. Explanation
	sampling					
107.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based sampling	Japan	Substantive	Formula 3:	Add ϕ to Formula 3 as follow; $P(X=i)=\binom{n}{i} \phi p^i(1-\phi p)^{n-i}$	It is necessary to add φ to Formula 3 because of considering efficacy of detection.
108.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based sampling	Australia	Editorial	Formula 3		Ideally should have a reference
109.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based sampling	Australia	Editorial	Formula 10	$n = -\ln[1-P(X>0)]/\phi p$	Is this correct?
110.	**APPENDIX 2** Sampling of large lots: binomial or Poisson based sampling	EC	Editorial	Table 3 and 4, explanatory text and header rows (cells 2 and 3)	Change "detection level(s)" to "level(s) of detection"	To use the term (3.1.1.2) consistently
111.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	Japan	Substantive	APPENDIX 3	Delete	This standard should not include methods which are not practical for general use. The calculation of sample size using a beta binominal distribution requires the degree of aggregation. However, it is generally difficult to obtain it.
112.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	USA	technical	Whole section	**Delete**	Delete Appendix 3. It does not provide information on how to quantify the degree of aggregation so it cannot be applied as such. Also this complicated process could not be very easily applied in a consignment or lot sampling situation. Not very practical. Using stratified sampling and/or cluster sampling and developing an optimal cluster size may be of more value.
113.	**APPENDIX 3**	Australia	Editorial	Title	Sampling for pests with an aggregated distribution: beta-	And in contents section

	1. Section	2. COUNTRY	3. Type of comment	4. Location	5. Proposed rewording	6. Explanation
	Sampling for pests with an aggregated distribution: beta-binomial based sampling				binomial **distribution** based sampling	
114.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	Australia	Editorial	Formula 11		Ideally should have a reference
115.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	Australia	editorial	Para 2	θ provides a measure of aggregation for the *j*th lot ~~θ is~~ ($0<\theta<1$)	Delete 'θ is'
116.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	Australia	Editorial	Para 3 sentence 2	When *f* is low, equation 1 can be estimated by….	Should this be equation 1 and 2?
117.	**APPENDIX 3** Sampling for pests with an aggregated distribution: beta-binomial based sampling	Australia	Editorial	Last para		Ideally should have a reference
118.	**APPENDIX 4** Comparison of hypergeometric and fixed proportion sampling results	Japan	Substantive	Title of table 5	~~Hypergeometric-based sampling (r~~Random sampling~~)~~ (finite population)	
119.	**APPENDIX 4** Comparison of hypergeometric and fixed proportion sampling results	EC	Editorial	Table 5, explanatory text	Change "detection level" to "level of detection"	To use the term (3.1.1.2) consistently

	1. Section	2. COUNTRY	3. Type of comment	4. Location	5. Proposed rewording	6. Explanation
120.	**APPENDIX 4** Comparison of hypergeometric and fixed proportion sampling results	EC	Editorial	Table 5 header rows (cells 2 and 3)	Change "confidence in detection" to "confidence level"	To use the term (3.1.1.3) consistently
121.	**APPENDIX 4** Comparison of hypergeometric and fixed proportion sampling results	EC	Editorial	Table 6, 2nd header row	Change "detection level" to "level of detection"	To use the term (3.1.1.2) consistently
122.	**APPENDIX 4** Comparison of hypergeometric and fixed proportion sampling results	Japan	Substantive	Table 6	See attached file	Table 6 should be amended to reflect the context of section 8 more accurately.
123.	**APPENDIX 5** Formulae used in appendices 1–4	USA	editorial		**Move appendix 5 to 1 and renumber the rest of appendixes**	It would be more helpful to have it in front

[comments submitted by Japan]

APPENDIX 4

COMPARISON OF HYPERGEOMETRIC AND FIXED PROPORTION SAMPLING RESULTS

Table 5: Confidence in the results of different sampling schemes for a 10% detection level

	~~Hypergeometric-based~~ Random sampling (finite population)		Fixed proportion sampling (2%)	
Lot size	sample size	confidence in detection	sample size	confidence in detection
10	10	1	1	0.100
50	22	0.954	1	0.100
100	25	0.952	2	0.191
200	27	0.953	4	0.346
300	28	0.955	6	0.472
400	28	0.953	8	0.573
500	28	0.952	10	0.655
1 000	28	0.950	20	0.881
1 500	29	0.954	30	0.959
3 000	29	0.954	60	0.998

Table 6: Minimum levels that can be detected with 95% confidence using different sampling schemes

~~Hypergeometric-based~~ Random sampling (finite population)					Fixed proportion sampling (2%)	
	Fixed level of detection		Varying level of detection			
Lot size	sample size	minimum detection level	sample size	minimum detection level	sample size	minimum detection level
10	10	0.10	6	0.30	1	~~1.00~~1.20
50	22	0.10	8	0.30	1	~~0.96~~1.20
100	25	0.10	13	0.20	2	~~0.78~~0.85
200	27	0.10	13	0.20	4	~~0.53~~0.54
300	~~28~~27	0.10	27	0.10	6	~~0.39~~0.40
400	~~28~~27	0.10	28	0.10	8	0.31
500	28	0.10	35	0.08	10	0.26
1 000	28	0.10	35	0.08	20	0.14
1 500	~~29~~28	0.10	57	0.05	30	0.09
3 000	~~29~~28	0.10	58	0.05	60	0.05

(Explanation)
Table 6 should be amended to reflect the context of section 8 more accurately.