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Item 6 of the provisional agenda

EXCHANGE OF PRACTICES FOR TAKING SAMPLES FOR TUBER INSPECTION<sup>(\*)</sup>

Sampling Practices Applied in Seed Potato Certification

Note by the secretariat

This document summarizes replies to the UNECE Questionnaire on Sampling Practices Applied in Seed Potato Certification. The questionnaire was prepared by the Working Group, composed of the Netherlands, United Kingdom (rapporteur) and United States following the decision of the Specialized Section to carry out a survey of national sampling practices (ECE/TRADE/WP.7/GE.6/2006/13, para. 34). The questionnaire was sent out by the secretariat to forty-seven persons in thirty countries; twenty-one replies from sixteen countries were received. This document is presented for discussion.

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<sup>(\*)</sup> The present document has been submitted after the official documentation deadline by the Trade and Timber Division due to resource constraints.

1. Are all lots subject to inspection for diseases and faults? (See annex III of the Standard)

Countries	Yes	No	Some (%)
<b>Austria, Belgium, Canada, Finland, Germany, Greece, Holland, Ireland, Israel, Italy, Kenya, Luxembourg, Poland, Switzerland, UK</b> (Northern Ireland, Scotland), <b>US</b> (Idaho, Minnesota, Nebraska, Wisconsin)	x		
<b>UK</b> (England and Wales)			x

**Canada:** In Canada, a “lot” means the quantity of harvested seed potatoes of a variety and class that is identifiable by one certificate number. A “shipment” means the movement of one lot, or any part thereof, of seed potatoes to a single consignee. A minimum of one inspection per lot is done for domestic shipments (within Canada). It is recommended to inspect the first shipment from each lot. When a lot is shipped over several weeks or months, additional inspections are done. For export (all other countries including EU), each shipment is inspected.

2. When does lot inspection take place?

Countries	(a) At grading (b) Before shipping from unsealed final container (c) Before shipping from sealed final container
<b>Austria</b>	Always (a); sometimes (b-60%)/(c-40%)
<b>Belgium, Germany, Greece, Kenya, US</b> (Minnesota, Nebraska)	Always (a)
<b>Canada</b>	Sometimes (a-25% for domestic shipments, 100% for export markets; prior to loading in final mode of transportation)/(b-100% for export lots)/(c-inspection before sealing)
<b>Finland, UK</b> (England and Wales)	Sometimes (a)/(b)/(c)
<b>Holland</b>	Sometimes (a,b-15%)/(c-85%)
<b>Ireland</b>	Always (b); sometimes (a-50%)/(c-20%)
<b>Israel, UK</b> (Northern Ireland, Scotland)	Always (c)
<b>Italy</b>	Always (c); sometimes (b-10%)
<b>Luxembourg</b>	Always (a); sometimes (c)
<b>Poland</b>	Always (b)
<b>Switzerland</b>	Sometimes (a-40%)/(b-40%)/(c-20%)
<b>US</b> (Idaho)	Sometimes (a)/(b)/(c)
<b>US</b> (Wisconsin)	Always (a); sometimes (b)/(c)

3. Is time of inspection subject to inspector’s discretion because of other factors e.g. low temperature at grading, presence of rots at grading?

**Austria, Italy, Kenya, Poland, US** (Minnesota, Nebraska): No.

- Canada:** At the time of tuber grade inspection, there is generally flexibility with regard to the timing and priority for the seed lot inspection. Inspection should be done at the time the tubers are being loaded in the last mode of transportation.
- Germany:** The inspector has to check the seed lot at grading. The time of grading depends on the time of shipping and on the work process at potato storages. Before shipping, the inspector checks again the lot, not in the same way as at grading, to detect for example the development of rots.
- Greece:** During the summer period, when time is limited, time of inspection is not subject to inspector's discretion; during the winter period it is.
- Holland:** Inspection is always done prior to shipping. After grading at low temperatures or in case of tuber rots, seed lots are hold for 3 to 7 days to allow low temperature or rot symptoms to develop, before further examination takes place.
- Ireland:** Time of inspection is subject to inspector's discretion, depending on e.g. low temperatures, excessive moisture or soil on tubers, presence of diseases or rots, crop history.
- Luxembourg:** Inspection takes place before and during grading; a sample is also taken sometimes before shipping from sealed final container.
- Switzerland:** General remarks are made in the report on the results of inspection, whether at grading or final.
- UK (England and Wales):** A "lot" is a stock of certified seed potatoes; it is not each individual order/delivery of seed from a stock. Only stocks that are marketed are inspected, all of them. Inspection may take place at (a), (b) or (c) at inspector's discretion.
- UK (Northern Ireland):** Yes. If rots are present at grading, inspector may delay sealing to ensure that rots are not developing in the lot. Inspector may also refuse to seal during a prolonged cold spell where there is a risk of frost damage to tubers.
- UK (Scotland):** If progressive diseases e.g. rots, skin spot are present, inspector may delay acceptance of the lot if there has been insufficient time between grading and inspection for disease development. This will also apply if a lot containing rots has been re-graded and presented for inspection immediately.
- US (Idaho):** Inspected by Federal/State Inspection Service at the shipping point prior to bulk and/or bagged shipments.
- US (Wisconsin):** Inspections only done during grading or loading of individual containers (<50 kg), trucks or temporary storage bins. These steps may be limited by low temperatures, but inspector has discretion to collect samples any time during the process.

4. How many containers are sampled relative to the size of lot, in tons (t)? If sampling rate varies with tonnage of lot, use different columns and insert tonnage before t. The percentage column should indicate the weight of sampled containers relative to the total tonnage of the lot.

In this and other tables below country replies refer to both, domestic/EU shipments and exports outside EU, unless otherwise indicated.

<b>Domestic/EU shipment</b>	<b>Tonnage of lot</b>			
<b>Austria</b>	t	25t	t	%
(a) 25kg container		25		2.5
(b) 50kg container		15		3.0
(c) >50kg container		3		6.0
Minimum sampling rates are laid down in the Austrian Seed Potato Regulation. The response at (c) relates to containers of 500 kg.				
<b>Belgium</b>	t	t	t	%
(a) 25kg container				0.5
(b) 50kg container				0.5
(c) >50kg container				0.5
At grading, tubers are taken out of the stream for control.				
<b>Canada</b>	t	t	t	%
(a) 25kg container				1.0
(b) 50kg container				1.0
(c) >50kg container				1.0
<p><b>Domestic shipment:</b> A minimum of one inspection per lot is done for domestic shipments. It is recommended to inspect the first shipment from each lot. When a lot is shipped over several weeks or months, additional inspections are done. Regardless of the size of the shipment, 1 per cent of the total tonnage is sampled for inspection uniformly across the shipment. If the initial shipment meets the regulatory tolerances, the sample rate is reduced to 0.5 per cent for subsequent shipments from the same lot.</p> <p>For bagged lots (&lt;50kg container), the number of bags required to comprise 1 per cent or 0.5 per cent by weight of the shipment or lot would be randomly sampled across the lot. For bulk lots (&gt;50kg container), sub-samples (e.g. 10 kg baskets) are taken randomly across the shipment or lot. The sub-samples are assessed and recorded independently, and the results are combined mathematically for the inspection report.</p> <p><b>Export:</b> Each export shipment is inspected. The aim is to sample 1 per cent or more of each shipment. Regardless of the size of the shipment, 1 per cent of the total tonnage is sampled for inspection uniformly across the shipment. If the initial shipment meets the regulatory tolerances, the sample rate is reduced to 0.5 per cent for subsequent shipments from the same lot. For bagged lots (&lt;50kg container), the number of bags required to comprise 1 or 0.5 per cent by weight of the shipment would be randomly sampled, across the shipment. For bulk lots &gt;50kg container, sub-samples (e.g. 10 kg baskets) are taken randomly across the shipment/lot. The sub-samples are assessed and recorded independently, and the results combined mathematically for the inspection report.</p>				
<b>Finland:</b> 400 tubers per 50 tons are inspected.				
<b>Germany</b>	t	t	t	%

(a) 25kg container					
(b) 50kg container	50			1.0	
(c) >50kg container	50			1.0	
Out of 1000 bags (50 kg each) 10 bags are opened to take individual 3 kg samples. They are then mixed and the final sample of 25 kg is drawn for examination.					
<b>Greece</b>	7t	15t	25t	%	
(a) 25kg container					
(b) 50kg container	7	12	20	5.0/4.0/4.0	
(c) >50kg container					
At grading, tubers are taken out of the stream for control.					
<b>Holland</b>	<5t	5-75t	75-150t	%	
(a) 25kg container	>=2	>=6	>=10		
(b) 50kg container	1-2	>=3-4	>=5		
(c) >50kg container					
Big bags and large containers are inspected during grading and/or during loading; no specific sample size. At the moment exports to non-EU countries are double checked (first NAK and a pre-shipment check by Plant Protection Service).					
<b>Ireland</b>	1-5t	6-10t	11-15t	%	
(a) 25kg container	2-10	12	14	5.0	
(b) 50kg container	1-5	6	7	5.0	
(c) >50kg container	1-5	5	5	5.0	
The above are minimum sampling rates and the response at (c) relates to 1-ton containers. These minimum rates are 50kg per ton or 250 kg per consignment where this weight represents the smaller sample size. Inspectors may use higher sampling rates if they consider such rates to be appropriate and may, for example, require 1-ton containers to be passed through grading equipment again to allow examination of the entire container.					
<b>Israel</b>	100t	T	t	%	
(a) 25kg container					
(b) 50kg container					
(c) >50kg container	10			10	
Usually work with jumbo bags or containers of 500 kg.					
<b>Italy</b>	<50t	50t	100t	%	
(a) 25kg container	3	5	8	2.5	
(b) 50kg container	2	3	5	3.0	
(c) >50kg container	-	-	-		
The maximum weight of the lot is 100 tons.					
<b>Luxembourg</b>	t	t	t	%	
(a) 25kg container					
(b) 50kg container	25			0.2	
(c) >50kg container					
<b>Poland</b>	<5t	5-10t	10-20t	20-35t	35-50t
(a) 25kg container	5	7	8	12	
(b) 50kg container	3	4	5	6	8
(c) >50kg container	1	1	1	2	3
<b>Switzerland</b>	<5t	5-12t	>12t	%	

(a) 25kg container (bags)	5	8	10	
(b) 50kg container	3	4	6	
(c) >50kg container	2	3	4	
(a) The lot is in the grading house: inspector takes a 10kg sample per 5 tons of seed. (b) The lot is in the grading house or on a farm: inspector takes one or more 10 kg samples, gives the label before sealing the container. (c) The lots are ready for shipping: inspector opens containers, takes one or several 10kg samples for evaluation, authorizes (or not) the shipment.				
<b>UK (England and Wales)</b>	1-5t	>5t	t	%
(a) 25kg container	2 in 20	10		
(b) 50kg container	1 in 20	5		
(c) >50kg container	1 in 20	5		
This is under review but is not likely to increase. Inspector has discretion to decide on how many containers over 50 kg to inspect. Minimum number is 5 but may inspect more containers.				
<b>UK (Northern Ireland)</b>	<5t	>5t	t	%
(a) 25kg container	Up to 10	10+		1.0-5.0
(b) 50kg container	Up to 5	5+		1.0-5.0
(c) >50kg container	Up to 250kg	250kg+		1.0-5.0
The above represent the minimum sample sizes per lot according to Northern Ireland Regulations. Normally the maximum size of lot is 25 tons.				
<b>UK (Scotland)</b>	0.025-50t	1-50t	>50t	%
(a) 25kg container	1-10		+2/10t	5.0
(b) 50kg container	1-5		+1/10t	5.0
(c) >50kg container		2-5	+1/10t	
Lots presented in small containers are sampled at a rate of 5 per cent by weight up to the first 5 t, thereafter the minimum weight is applied up to 50 t, so up to 250 kg (i.e. 5 x 50 kg sacks or 10 x 25 kg sacks). For lots over 50 t, an additional 50 kg sample is taken for every 10 t (or part thereof) over the initial 50 t (i.e. 1 x 50 kg sack or 2 x 25 kg sack). Large containers are sampled at a rate of 1 in 4 up to a minimum of 5 containers. Minimum number of containers sampled is 2 unless only one is presented. For lots greater than 50 t, an additional container is sampled for each 10 t or part thereof above the 50 t.				
<b>US (Idaho):</b> All shipments are sampled at a rate of at least five 20-pound samples per 50 000 pound load.				
<b>US (Minnesota, Nebraska):</b> Shipments are domestic. Standard load is 45 000 pounds (1 pound = 0.453 kg). Sample rate is one 25-pound sample for each 50 cwt (1 cwt = 100 pounds = 45.3 kg). Eight samples per trailer.				
<b>US (Wisconsin)</b>	t	t	t	%
(a) 25kg container			0.025	100
(b) 50kg container			0.05	100
(c) >50kg container			22.5	100
Ten samples per container > 50 kg (typically 22.5 t).				
<b>Export to non-EU</b>				
<b>UK (Scotland)</b>	0.025-50t	0-20t	>5t	%
(a) 25kg container	1-10		+2/10t	

(b) 50kg container	1-5		+1/10t	
(c) >50kg container		2-5	+1/10t	
For lots in small bags presented for marketing outside the EU, sampling is at the rate of 5% by weight up to 5 t. After the first 5 t, an additional 50 kg (one 50 kg container or two 25 kg containers) is sampled for each 10 t (or part thereof) over the first 5 t. For large containers, samples are taken at a ratio of 1 in 4 containers up to 20 t. After the first 20 t, an additional container is sampled for each 10 t (or part thereof) over the first 20 t.				

5. What is the size of sample taken from individual container relative to the size of the container? As appropriate, specify tonnage in each column.

<b>Domestic/EU shipment</b>	<b>Tonnage of lot</b>			
<b>Austria</b>	t	25t	t	%
(a) 25kg container		1.0kg		4.0
(b) 50kg container		1.5kg		3.0
(c) >50kg container		2.5kg		0.5
<b>Belgium</b>	t	t	t	%
(a) 25kg container				0.5
(b) 50kg container				0.5
(c) >50kg container				1.0
(a) 25 kg container: 20000 kg (800 sacs), control of 4 sacs. (b) 50kg container: 20000 kg (400 sacs), control of 2 sacs. (c) Bigbags (900-1000 kg): 20000 kg (20 bigbags), control of 2 bigbags. If necessary, more containers are controlled.				
<b>Canada</b>	t	t	t	%
(a) 25kg container				1.0
(b) 50kg container				1.0
(c) >50kg container				1.0
For bagged shipments, bags are randomly selected from the shipment or lot, and the entire contents of each is inspected. For example, in a shipment of 400 bags, 4 bags (1 per cent) would be entirely inspected. It is assumed that bags are evenly distributed within the shipment or lot. For bulk shipments, sub-samples (e.g. 10 kg baskets) are taken randomly across the shipment. For example, in a shipment of 25 000 kg, a sample of 250 kg (1 per cent) would be required. 25 sub-samples of 10 kg would be taken randomly across the shipment.				
<b>Finland:</b> 400 tubers per 50 tons are inspected.				
<b>Germany</b>	t	t	t	%
(a) 25kg container				
(b) 50kg container	50			6.0
(c) >50kg container				
<b>Greece</b>	7t	15t	25t	%
(a) 25kg container				
(b) 50kg container	57	33	20	12.6/7.3/4.5
(c) >50kg container				
Figures 57/33/20 refer to the number of tubers sampled per container. Each container has about 450 tubers.				

<b>Holland:</b> The sample is the content of the container (25 or 50 kg).					
<b>Ireland</b>	1-5t	6-10t	11-15t	%	
(a) 25kg container	25kg	25kg	25kg	100.0	
(b) 50kg container	50kg	50kg	50kg	100.0	
(c) >50kg container	50kg	50kg	50kg	5.0	
Response at (c) relates to 1-ton containers.					
<b>Israel</b>	100t	t	t	%	
(a) 25kg container					
(b) 50kg container					
(c) >50kg container	5kg			0.5	
<b>Italy</b>	<50 t	50 t	100 t		
(a) 25kg container	40 tubers	25 tubers	15 tubers		
(b) 50kg container	60 tubers	40 tubers	25 tubers		
(c) >50kg container	-	-	-		
The aim is to get about 120 tubers.					
<b>Luxembourg</b>	t	t	t	%	
(a) 25kg container					
(b) 50kg container	25			0.2	
(c) >50kg container					
<b>Poland</b>	<5t	5-10t	10-20t	20-35t	35-50t
(a) 25kg container	4	4	4	8	8
(b) 50kg container	1	1	3	3	4
(c) >50kg container	50kg	50kg	2x50kg	2x50kg	3x50kg
<b>Switzerland</b>	<5t	5-12t	>12t	%	
(a) 25kg container (bags)	2kg	3kg	3kg		
(b) 50kg container	4kg	5kg	5kg		
(c) >50kg container	5kg	6kg	8kg		
<b>UK (England and Wales)</b>	1-5t	>5t	t	%	
(a) 25kg container	25kg	25kg			
(b) 50kg container	50kg	50kg			
(c) >50kg container					
Inspectors decide what quantity to inspect from each container over 50 kg. This is under review and is not likely to increase.					
<b>UK (Northern Ireland)</b>	<5t	>5t	t	%	
(a) 25kg container	25	25		100.0	
(b) 50kg container	50	50		100.0	
(c) >50kg container	Up to 250kg	250kg+		1.0-5.0	
For smaller containers all the contents of the sampled container are inspected. For containers over 50 kg only a proportion of the container is inspected.					
<b>UK (Scotland)</b>	t	t	t	%	
(a) 25kg container	25kg				
(b) 50kg container	50kg				
(c) >50kg container	200 tubers or 50kg				

For small bags (up to 50 kg) all tubers in a container are inspected. For large containers, at least 2 x 100 tubers are sampled from each container. If the findings on this sample suggest that the lot is close to tolerance (>80%), 5 % of the weight of the lot is sampled from the selected containers (up to a minimum sample weight of 250 kg).  
There is a lower lot weight trigger for sampling of additional containers.

**US** (Idaho, Minnesota, Wisconsin): Same as in question 4.

6. Are individual samples mixed or not before examination?

The practices described in the table below are for domestic, EU and non-EU shipments.

Countries	Yes	No
<b>Austria:</b> Individual samples belonging to a specific lot are mixed in a special container. 200 tubers are taken for examination.	x	
<b>Germany:</b> Individual samples of 1-3 kg are mixed; final sample of 25 kg is taken from the mixed tubers for examination.	x	
<b>Israel:</b> All the samples are put together on the inspection table before examination.	x	
<b>Italy, Switzerland:</b> For lots <5 tons one sample of 10 kg is taken from several containers; for lots of 5-12 tons two samples of 10 kg are taken from several containers; for lots of >12 tons three samples of 10 kg are taken from several containers.	x	
<b>Belgium, Finland, Greece, Ireland, Kenya, Luxembourg, Poland, UK</b> (England and Wales, Northern Ireland, Scotland), <b>US</b> (Idaho, Minnesota, Nebraska, Wisconsin)		x
<b>Canada:</b> Individual sub-samples are not mixed before examination. The results of individually examined sub-samples are mathematically combined in the tuber inspection report. For example, for a shipment of 400 bags inspected at a rate of 1 per cent, 4 bags would be inspected; for a 25 000 kg shipment, 25 x 10 kg baskets would be inspected, and results for each bag or basket would be recorded separately and then combined in the final report. The final result must meet the grade standard.		x
<b>Holland:</b> The readings are “mixed”; with maximum tolerance for individual containers.		x

7. Are samples washed for inspection?

Countries	Yes	No	Sometimes (%)
<b>Austria, Belgium</b>	x		
<b>Israel:</b> Tubers should be completely clean and free of soil for easy inspection.	x		
<b>Luxembourg:</b> All samples are washed and a photo is taken before grading.	x		
<b>Canada (domestic shipment):</b> Tubers should be reasonably clean to allow for visual inspection. Reasonably clean means		x	

that the potatoes are reasonably free from soil, and when they are in a container, there is not more than a slight amount of loose soil or foreign material in the container.			
<b>Germany:</b> To wash tubers is too difficult. In most cases tubers are dry and clean. Tubers for export are brushed. It is necessary for detection of Rhizoctonia on tubers from dark soils.		x	
<b>Holland:</b> In case of doubt the adhering soil is removed, occasionally with water		x	
<b>Ireland:</b> Could be washed if importing country so requested		x	
<b>Kenya:</b> Seed samples are not washed to avoid rotting		x	
<b>Poland, UK</b> (England and Wales, Northern Ireland), <b>US</b> (Idaho, Minnesota, Nebraska)		x	
<b>Switzerland:</b> Sample can be partially washed to assure diagnostic		x	
<b>Canada (exports):</b> Depends on requirements of importing country and pests of concern. Tubers are usually washed to certify the absence of powdery scab. Loose dirt is removed or brushed off prior to inspection, at the discretion of the inspector or expectation of the importing country. Depending on the type of soil and its adherence to tubers, the sample may be washed in water to expose defects.			<10
<b>Finland:</b> Potatoes are washed if needed for inspection; it depends on the type of soil and other factors			x
<b>Greece:</b> Samples are washed for laboratory tests			x
<b>Italy, UK</b> (Scotland): Samples are washed at the discretion of the inspector. Washing is carried out for an accurate assessment of surface diseases where these are present in the stock and are potentially being masked by adhering soil. This procedure is applied to lots destined for non-EU markets more frequently than EU markets and this reflects stricter surface area tolerances or the necessity to confirm absence of nil-tolerance surface faults.			x
<b>US</b> (Wisconsin): Upon request of applicant (seed seller and payer of inspection fees) or receiver, samples may be washed. This is almost never requested.			x

## 8. Are tubers in sample cut for internal inspection?

Countries	Yes	No	Number or % of sample weight
<b>Austria, Finland</b>	x		100%
<b>Belgium, Germany</b>	x		50%
<b>Canada:</b> To assess tuber samples for meeting the tolerance for internal necrosis, a sub-sample of tubers must be cut and examined internally. Tubers shall be selected from the entire sample drawn for a single inspection. Initially 50 tubers are cut per	x		50 tubers initially

inspection. If any diseases or defects are found, an additional number of tubers must be cut to bring their total number to at least 200. If desired, the sample size may be increased to obtain statistically more significant results. If the initial inspection of a lot is within tolerance, 25 tubers may be taken and cut for subsequent inspections of the same lot.			
<b>Greece, Poland, US</b> (Wisconsin)	x		-
<b>Holland</b>	x		20/batch
<b>Ireland:</b> Domestic/EU shipment: No minimum, a few tubers cut at discretion of inspector. Export to non-EU: 200 tubers per plot/field to check for Spraing, where requested.	x		
<b>Israel</b>	x		10 tubers
<b>Italy:</b> sometimes			
<b>Kenya:</b> Tubers are sampled while still in the field to ascertain freedom from diseases. Tests are done under lab conditions.			
<b>Luxembourg</b>	x		0.1%
<b>UK</b> (Northern Ireland): No fixed guidelines, tubers are cut when required	x		
<b>US</b> (Idaho)	x		0.2%
<b>US</b> (Minnesota, Nebraska): when internal defects are present, all tubers of one sample	x		85/sample
<b>Switzerland</b>		x	
<b>UK</b> (England and Wales): Cutting does not take place unless inspector has reason to suspect a problem which requires cutting the tuber.		x	
<b>UK</b> (Scotland) for domestic/EU shipment for export to non-EU: done only where internal faults are specified in the destination country requirements.	x	x	20/bag