ECONOMIC COMMISSION FOR EUROPE

COMMITTEE FOR TRADE, INDUSTRY AND
ENTERPRISE DEVELOPMENT

Working Party on Standardization of
Perishable Produce and Quality Development

Specialized Section on Standardization of
Seed Potatoes
31 January -3 February 2000, Geneva

Item 8 of the Provisional Agenda

ROUTINE PROCEDURES FOR SAMPLING

Transmitted by France and the Netherlands

Tuber indexing and statistics - explanatory note

Already several meetings of rapporteurs/experts (already since 1994) the usefulness of including statistics in the UN/ECE standard was discussed. The, so far unanswered, question is whether a 'sampling plan' should offer flexibility to the user - only presenting usefully statistics - and in which format the information could be presented best.

Following previous discussions it is suggested to only include basic information, enabling users to define sample size, given specific tolerances applied in a seed scheme. For more detailed information handbooks on statistics are available.

The documents attached to the explanatory note are somewhat simplified versions of what has been distributed and discussed before. It contains two tables and two graphs:

GE-99

Classification table / graphs

For both categories, basic seed and certified seed, probabilities of classification are presented for different sample sizes (100, 200, 300 and 400) and different infection levels. Ideally, seed lots with infection levels below the tolerance (for basic seed 4%) would be accepted and seed lots above the tolerance would be refused. This is no reality however. Statistics show a fair chance of acceptance of a basic seed lot with more than 4% virus. But also there is a fair chance of refusal of a seed lot that contains less virus than 4%. The data presented in the table are visualised in graphs, for basic as well as for certified seed. It can be seen that larger samples give 'better statistics'. In any situation, considering advantages of bigger samples (better statistics, more reliable test result) and disadvantages (higher costs; logistic aspects) should lead to a well balanced choice of sample size.

Intervals of possible readings

Testing different samples from the same seed lot will most likely give different readings, with variation within a so called 'confidence-interval'. Statistics offer possibilities to calculate intervals, given a specific level of confidence. For instance, at a 95% confidence level, testing a 4% infected seed lot with 100 tubers, 95% of the readings will vary between 0.62 and 8.52.

TABLES

POST-HARVEST TEST FOR VIRUSES based on ECE tolerance levels

Chance of classification based on the permitted number of infected tubers   for the various classes, sample-sizes and levels of infection.

Sample size	Permitted number infected tubers	Chance of classification						
		% infected tubers						
		0,5	1	2	4	6	8	10
100	3	100	98	86	43	14	4	1
200	7	100	100	95	45	8	1	0
300	11	100	100	98	46	5	0	0
400	15	100	100	99	46	3	0	0

Basic seed max 4%

Sample size	Permitted number infected tubers	0,5	1	2	4	6	8	10
100	8	100	100	100	98	85	59	32
200	18	100	100	100	100	97	75	37
300	30	100	100	100	100	100	91	55
400	40	100	100	100	100	100	94	54

Certified seed max. 10%

POST-HARVEST TEST FOR VIRUSES intervals

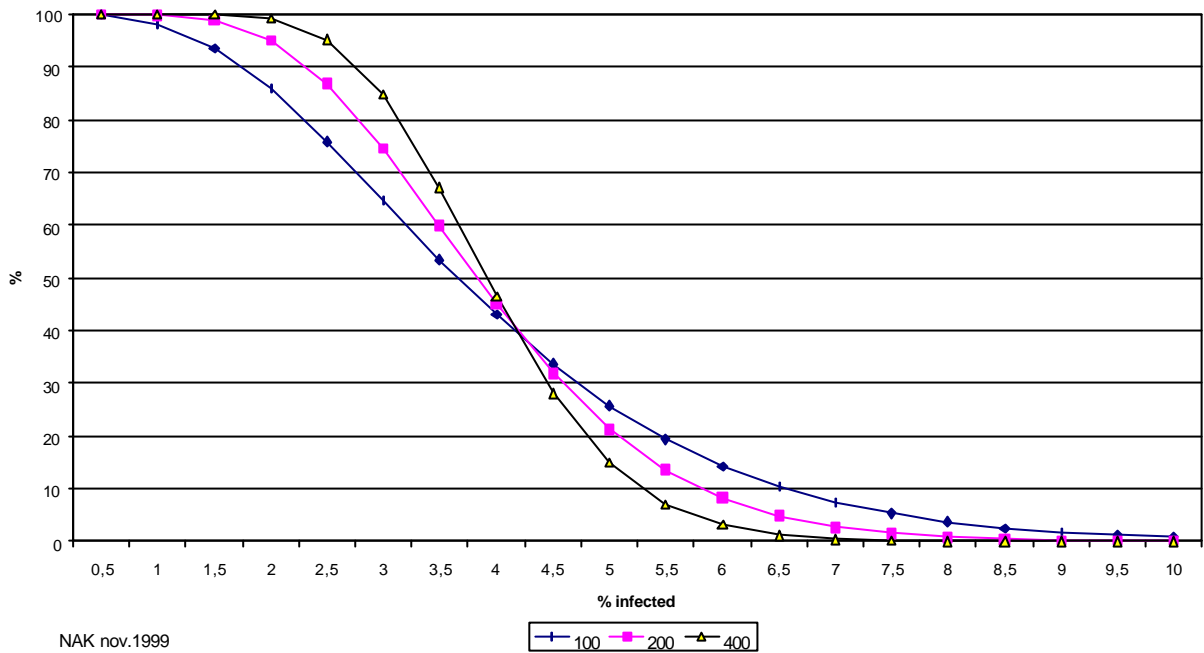Intervals of reliability for various sample-sizes and levels of infection.

Starting points:
* the number of tubers is very large
* samples are taken at random
* the lot has a homogeneous distribution of the infections
* probability is 95%

	size of sample	permitted number infected	lower limit	interval upper limit
Basic seed	100	3	0,62	8,52
4%	200	7	1,42	7,08
	300	11	1,84	6,47
	400	15	2,11	6,11
Certified seed				
10%	100	8	3,52	15,16
	200	18	5,42	13,85
	300	30	6,85	13,97
	400	40	7,24	13,37

BASIC SEED (4%)

chance of approval

% infected

NAK nov.1999

100   200   400

CERTIFIED SEED(10%)

Chance of approval

% infected

NAK nov.1999

100   200   400