

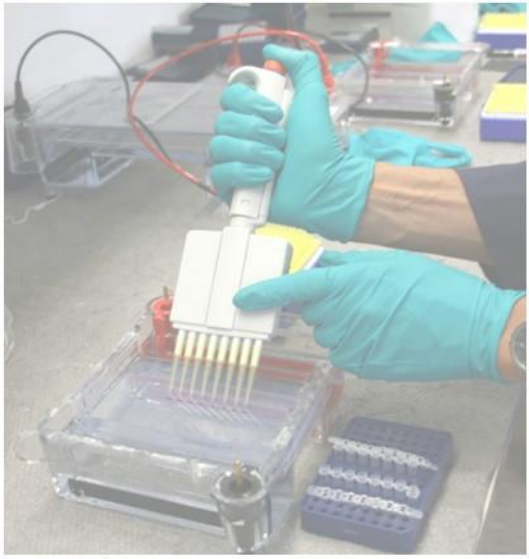


# Conditions 2025

For service laboratories conducting quality tests on:

- (parts of) plants
- seeds
- soil




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## Introduction

Authorized Service Laboratories Naktuinbouw (ASLN) is an official authorization system of Naktuinbouw, based upon annual external audits by or on behalf of Bureau Authorizations and intended for service laboratories that carry out sampling and quality tests on seeds, soil and / or (parts of) plants. The test results of these ASLN authorized laboratories are accepted by Naktuinbouw, e.g. for inspections, Naktuinbouw Elite Ornamental Crops, Naktuinbouw Select Plant as well as Naktuinbouw Authorized Laboratories (NAL). The ASLN Conditions 2025 are an improved version of the EMT Conditions (2001) and the ASLN Conditions 2012, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024.

When laboratories are working in compliance with the ASLN Conditions, it will give them the confidence that their clients will receive a reliable test result, reflecting the true quality of the seeds, soil and / or parts of plants.

The ASLN authorization of a laboratory is demonstrated through the ASLN certificate of authorization, with an appendix stating for which tests authorization has been granted by Bureau Authorizations. This is also displayed on the website of Naktuinbouw.

On its turn, an ASLN authorized laboratory is allowed to issue ASLN Laboratory reports with test results from tests for which authorization has been granted. The laboratory must carry out the test according either the Naktuinbouw standard protocol or a by Bureau Authorizations approved in house company protocol.

Sampling, testing and issuing ASLN Laboratory reports is only allowed for crops under the supervision of Naktuinbouw inspections[1]

The ASLN Conditions 2025 are based upon for this purpose relevant criteria from:

- Earlier revisions of the ASLN Conditions
- Council directive 2000/29/EC
- EPPO PM 7/84:2007 Basic requirements for quality management in plant pest diagnosis laboratories
- EPPO PM 7/98:2014 Specific requirements for laboratories preparing accreditation for a plant pest diagnostic activity
- ISPM No. 31, 2008, Methodologies for sampling of consignments
- ISO 9001:2015 QMS – requirements
- ISO 17025:2005 General requirements for the competence of testing and calibration laboratories
- ISTA Laboratory Accreditation Standard version 6.1
- Official Controls Regulation 2017/625/EU
- Plant Health Regulation 2016/2031/EU
- Guidelines for the company version 9

The ASLN Conditions 2025 are divided into the following standard modules: Quality management system requirements, Sampling requirements and Testing requirements.

Determined by the Board of Naktuinbouw
Roelofarendsveen, 13 December 2024

[1] See 'Regeling verhandeling teeltmateriaal'

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## NAKTUINBOUW MODULE QUALITY MANAGEMENT SYSTEM REQUIREMENTS

**1. Identity**

1.1 The participant must be legally identifiable (e.g. registered in a national chamber of commerce)

**2. Scope**

2.1 The participant must mention its scope in the quality manual, and make clear where which activities are carried out under authorization

2.2 The participant must keep this up to date

**3. Quality management system (QMS)**

3.1 The participant must develop, define, document and implement a QMS as a means of ensuring that all activities that are brought under authorization demonstrably satisfy specified requirements / conditions

3.2 The participant must improve this QMS continuously whenever there is a reason to, based upon the principle of the Deming circle: plan – do – check – act

**4. Quality manual**

4.1 The participant must have at least one quality manual

4.2 This quality manual can be either digital or a hard copy

4.3 Contents:

4.3.1 This quality manual must contain at least:

- Scope
- QMS-documents (procedures, working instructions, protocols, format of forms), as required by the concerning scheme, or a reference to them

4.3.2 In the quality manual must be indicated which paragraphs from these Conditions are excluded (only possible for: 17, 18, 19, 20, 23 and / or 24)

4.4. Language:

4.4.1 The quality manual and the QMS-documents must be written in Dutch or English

4.4.2 If the participant wants to have some documents (like working instructions) in the local language as well:

- This is only allowed when the format, the content and the revision indication are the same as the English revision; in case of differences between both versions, the English version will prevail
- The participant must provide an interpreter during the audit
- The above is not applicable for test protocols, sampling procedure/protocol and where relevant the procedure for issuing NAL Quality certificates or ASLN Laboratory reports, they must be written in Dutch or English at all times

**5. Organization**

5.1 The participant must (where and when necessary) explicitly have obtained the required approval of authorities involved

5.2 The participant must have a quality manager (irrespective of title), directly responsible for the QMS (regarding e.g. building, implementing, monitoring and maintenance of the QMS), including reporting to a technical managing director about its functioning

5.3 The participant must define tasks, responsibilities and competences needed (including substitution for key personnel), for ensuring proper functioning and control of all processes

5.4 The participant must appoint a process owner for each process

5.5 The participant's staff must be informed clearly about the tasks and responsibilities assigned to them, by means of: procedures / working instructions / protocols, job descriptions, qualification / training / experience / craftsmanship and / or adequate supervision

5.6 The participant's staff must be demonstrably competent for the tasks and responsibilities assigned to them

5.7 Even if certain tasks have been outsourced, the participant is still responsible for these outsourced processes; the participant must ensure that these have been carried out in compliance with the requirements of the concerning scheme at all times

5.8 The participant must determine any product / process requirements needed for specific or intended use, legal or statutory requirements

5.9 The participant must be organized in such a way that the employees are not under any financial, commercial, or other kind of pressure that could influence the performance of the work of that what is brought under authorization (in relation to its scope)

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5.10 Every influence on results, by people / organizations outside the participant, must be excluded
5.11 The remuneration of employees involved in that what is brought under authorization (in relation to its scope), must not depend on the amount of work or the outcome of the work
5.12 The participant must refrain from activities that could endanger the trust in the independence of assessments and the integrity of its activities
5.13 In case of external service, the participant must deal with contract review, ensuring that only client requests are accepted when the participant knows the requirements / specifications and that she has the capability of meeting those requirements / specifications
5.14 In case of external service, the participant must deal with control of verification, storage and maintenance of all customer supplied products

**6. Document control**

6.1 Documents must be controlled
6.2 Documents must be approved by a process owner, prior to use
6.3 Documents must be implemented
6.4 Each document must have a revision indication (either a date or a number)
6.5 Relevant external documents must be controlled / implemented either
6.6 Documents must be kept up to date
6.7 Unintended use of obsolete documents must be prevented
6.8 It must be clear which obsolete documents have to be kept (for how long and where) and that every obsolete document that is filed for legal purposes and / or to maintain knowledge, is identified in a suitable manner
6.9 Obsolete documents have to be discontinued in myNaktuinbouw

**7. Control of records**

7.1 The participant must control all records
7.2 Records must be kept in such a way that the participant is able to demonstrate its compliance to the requirements of the concerning scheme, that critical control points in the process have been monitored and that the outcome of this has led to a process / product within specifications / requirements. The period of keeping records may differ, but
- local legal obligations must be fulfilled
- must be kept for at least 5 years, unless local legal obligations prevent this

7.3 The participant must deal with access to, and identifying, collecting, indexing, archiving, storing, storing term, maintaining and disposal of records
7.4 The reliability of the quality records must be guaranteed
7.5 Where systems for electronic data processing are used, the reliability and stability of the system must be tested demonstrably and a backup has to be made within determined intervals
7.6 Data security must be ensured, including prevention or unauthorized access and unauthorized modification of data
7.7 All calculations and data transfer must be subjected to suitable inspection

**8. Audits**

8.1 The participant must conduct internal audits to verify whether or not daily practices are in line with its QMS and the requirements of the concerning scheme
8.2 Internal audits:
8.2.1 Must be planned in good time for all processes
8.2.2 Must be completed for secondary processes once per 3 years
8.2.3 Must be completed for primary processes annually (where relevant)
8.2.4 Furthermore the planning must be based upon all relevant aspects (e.g. outcome of earlier audits, ring tests, process performance, possible changes, etc.)
8.2.5 Must be planned in good time for possible Multi Location Module-sites (for sampling):
- If there are no NCs established during the external audit (once per 3 years), then there is no obligation to conduct an internal audit for this site; but of course it remains the responsibility of the participant to decide upon this, based upon their view / information gathered during monitoring of the process
- If there are NCs established during the external audit, Bureau Authorizations will then (given the weight and nature of the NCs) indicate to the participant whether it is required to conduct an internal audit in the next year

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- If an internal audit is required, the participant must determine, according to its own findings, whether it is necessary to conduct an internal audit in the following year

8.3 Internal auditors must be independent regarding the process which they have to audit

8.4 Internal auditors must have attended an auditor training course, which:

8.4.1 Must last for four day parts at least

8.4.2 Must deal with:

- General information about the audit process
- Drawing up an audit program
- Conducting an audit
- Interview techniques (dealing with personal communicative skills)
- How to establish non conformities
- Reporting

8.5 The results of internal and external audits must be recorded and reported to the process owner

8.6 In case of a non-conformity established during internal and external audits, there must be drawn up a CAR (see 10)

## 9. Complaints

9.1 The participant must deal with written or verbal (internal and external) complaints

9.2 In the event of a connection between the complaint and the scope for the concerning scheme, the participant must draw up a CAR (see 10)

## 10. Corrective (and / or Preventive) Action Requests (CARs)

10.1 The participant must deal with CARs adequately

10.2 This paragraph is applicable to various deficiencies, which become apparent e.g. by either observing / monitoring the process by staff, audits, calibration, ring tests, proficiency tests, clients and / or complaints

10.3 All CARs must be analyzed to determine the root cause (underlying problem) and the impact

10.4 The participant must determine an adequate corrective action to solve the underlying problem

10.5 The participant must implement this corrective action

10.6 The participant must be able to demonstrate evidence of this corrective action

10.7 The participant must verify the corrective action after an appropriate amount of time, to understand if the corrective action itself was sufficient / effective in relation to the underlying problem

## 11. Management responsibility

11.1 Management must be able to demonstrate its commitment to comply with the requirements of the concerning scheme

11.2 The management must conduct a management review annually

11.3 The participant must determine, collect and analyse suitable data, in order to substantiate the suitability and efficacy of the QMS and its compliance to the requirements of the concerning scheme, to enable it to decide where improvements are necessary

11.4 The input for the management review must therefore provide information on the following points as a minimum:

- Outcome of internal and external audits
- Outcome of job appraisals **/** need for training
- Feedback from clients
- Process performance and product conformity
- Status of CARs
- Follow-up on quality policy / objectives / measures / action points from previous management review(s)
- Changes in / on the (environment of the) participant that will have an impact on the QMS

11.5 The output of the management review must indicate conclusions of the management regarding all input, including decisions and measures with regard to the improvement of the QMS (e.g. the need for extra training, means, etc.) by means of quality objectives

11.6 The management review must be demonstrable by means of minutes

11.7 The participant must present an overview of results / process performance / product conformity to the Bureau Authorizations on request

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**12. Human resources management**

12.1 The participant must ensure that suitable communication processes are established within and between the departments or functions in question

12.2 Staff must be demonstrably qualified (based upon suitable education, training and / or experience / craftsmanship)

12.3 The participant must identify whether there is a need for training

12.4 The participant must provide training where necessary

**13. Equipment, means, devices and reference materials**

13.1 The participant must be equipped with (or have access to) appropriate equipment, means, devices and reference materials, required / necessary where and when needed

13.2 The participant must identify and keep a log of all equipment, means, devices and reference materials which may (even unintentionally) influence the quality and accuracy of results. This log makes reference to:

- A unique reference (name, identification, type, reference and / or serial number)
- The condition in which it was received (e.g. new, used, overhauled)
- The name of manufacturer / supplier
- The service contractor for maintenance and / or calibration
- The date of receipt and /or date of activation
- The current location
- The details of any maintenance and / or calibration carried out
- The history of all damage, overload, faults, modification or repairs, incorrect handling, when it produces doubtful results or when it is defective and it has been taken out of use

13.3 All equipment, means, devices and / or reference material which has been taken out of use:

- Must be clearly marked or stored at a designated location, until it has been repaired, calibrated and / or validation demonstrates that it is performing correctly again
- The participant must draw up a CAR (see 10)

13.4 The participant must (where relevant) for this equipment, means, devices and / or reference materials (in relation to intended use) ensure / manage / make demonstrable:

- Acceptance / release, based on tests. Before the test can be started, criteria must be set, dealing with the allowed tolerance
- Appropriate use
- Maintenance and inspection
- Specified requirements, such as
  - Tolerances allowed by the participant itself
  - Measuring capacity / accuracy. The accuracy of devices used must be one digit more than the lowest value where it is used for (Example: if you need to measure exactly 1 gram, this scale needs to be able to measure 0,1 grams, where it matters if the quantity measured is 1,0 or 0,9 grams)
- Storage
- Appropriate disposal, to protect the participant's integrity / the environment

13.5 The participant must (where relevant) for these devices determine how and to ensure / manage / make demonstrable:

- Monitoring indicated values (in relation to critical control points)
- Calibration of the device:
  - At by the participant prescribed intervals
  - If the device is out of spec:
    - Adjustment of the device
    - Draw up a CAR (with the purpose of finding out what the impact is on the process where it has been used for in the period until the previous calibration, see 10)

13.6 For the execution of calibration:

- It is allowed to subcontract calibration to a competent subcontractor that is accredited by an accreditation body (like a2La, COFRAC, DAkkS, ISRAC or Raad voor Accreditatie) to perform calibration services. In case a very high accuracy of the device is needed, the participant should ensure itself that the subcontractor uses sufficiently accurate calibration instruments
- It is allowed to subcontract calibration to a non-accredited subcontractor, or calibration can be replaced by internal checks. In these cases

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- The calibration instrument must be calibrated and proof must be demonstrable of its valid reference to (inter)nationally recognized standards; if such a reference is not applicable, the participant must provide sufficient evidence of conformity / accuracy of results
- Deviation of the calibration instrument must be max 10% of the tolerances as determined for the device that needs to be calibrated (Examples: if a scale does have tolerances of +/- 2 grams; the 'stones' itself used for calibration must have a max deviation of +/- 0,2 grams. If it is allowed that the temperature in a growth chamber may vary +/- 2°C, the thermometer or logger that is used for maintaining that temperature must be calibrated by a calibration instrument that itself is having a max deviation of +/- 0,2°C, when possible)
- The requirement above is not applicable for the following devices:
  - The pH-meter, in case the device is calibrated by using calibration fluid, e.g. pH 4,01, pH 7,00 or pH 10,01. That what is on the market is okay and sufficient. Good practices are nevertheless important (e.g. preventing contamination of the calibration fluid by means of dirty sensors, storage in a dark place and application by proper temperatures)
  - (Real-Time) PCR instruments, in case the apparatus is calibrated through an appropriate calibration service (like CYCLERtest or instrument performance verification), which enables laboratories to assure its thermocyclers to perform according to specifications
- Good practices must be used, such as:
  - Touching small stones: with a glove / tweezers
  - Repeatability and eccentric load: multiple measurements (measuring precision)
  - Calibration in the range of the intended use
  - Calibration of a pipette at proper temperature (e.g. 20°C)

## 14. Purchasing

14.1 The participant must ensure the facilities, services and materials used are fit for purpose

14.2 The participant must where applicable and relevant:

- Provide purchase details of the product (on batch level) and / or service, giving consideration to the requirements
- Establish and introduce tests or other activities needed, to ensure that the products and / or service meet the requirements. Before the test can be started, criteria must be set, dealing with the allowed tolerance
- Define the type and degree of inspection of the product; this is dependent on the product, the influence that the supplied product has on the process where it will be used for and, in so far as applicable, on the reports of the quality audits and / or quality registrations and previous performance

14.3 The participant must:

- Evaluate suppliers and select them on the basis of their capacity to satisfy the requirements of the delivery contract
- Create and maintain quality registrations of accepted suppliers
- Maintain a list of approved subcontractors

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## NAKTUINBOUW MODULE SAMPLING REQUIREMENTS ASLN

### 15. General

15.1 Leading thought must be that a good representative sample is essential for obtaining a good and reliable test result

15.2 The sampling procedure / protocol (and related documents) must be approved by Bureau Authorizations through myNaktuinbouw and deal with the relevant requirements of the concerning scheme, including the requirements laid down in **Appendix I**

15.3 It must be ensured that sampling is not affected by any (preconceived) information, outside influences or improper pressure

15.4 Samples must be taken according a predefined schedule / assignment

15.5 Both the function drawing up the sampling schedule as well as the sampler can in no way be someone that has an interest in the outcome / result of the test

15.6 The participant must deal with receipt, handling, storage and appropriate disposal of samples, to protect the participant's integrity / the environment

15.7 The participant must decide how they want to deal with samples by indicating:

- Whether they want to keep a sample
- How big the sample needs to be
- How long they want to keep the sample

15.8 At all stages of transport, storage, handling and preparation of samples, measures must be taken to prevent loss, damage and / or deterioration

15.9 In case the participant is not responsible for sample taking, but testing only (e.g. because the client has taken care of this), this must be indicated on the certificate, by adding*:*

- the test has been conducted on a sample that has been submitted by (or on behalf of) the client
- the test has been conducted on a submitted sample

### 16. Sampler

16.1 Must have adequate sampling expertise / techniques and the skills to apply these

16.2 Must be demonstrably trained at an approved institute:

16.2.1 For (parts of) plants:

- Naktuinbouw
- Other institutes or participants of which the training is approved by Bureau Authorizations through myNaktuinbouw

16.2.2 For seeds:

- ISTA
- Naktuinbouw
- NIAB (UK)
- Nébih (H)
- SGS Brookings (USA)
- Semea / ASFIS (F)
- Other institutes or participants of which the training is approved by Bureau Authorizations through myNaktuinbouw

16.2.3 For soil:

- Naktuinbouw
- Other institutes or participants of which the training is approved by Bureau Authorizations through myNaktuinbouw

16.3 Attend refresher course

- Must maintain his / her expertise / techniques and attend a refresher course at least once every 4 years,
- It is allowed for participants to organize this in-company themselves.
- Possible input (not obligatory / exhaustive):
  - To share experiences of samplers in a meeting; what do they face (method, material, instructions, daily practices, etc.) and where did it perhaps go wrong earlier?
  - To discuss possible non conformities from internal or external audits, adapted procedures, instructions or forms
  - To witness together a sampling being performed, and discuss what will be observed

16.4 The sampler can be assisted by a trainee, as long as the trainee is working under his / her supervision on the job; the sample administration must make demonstrable who the sampler was and who the trainee

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## 17. Multi location module (MLM) and subcontracting of sampling

17.1 The multi location module is optional and relevant for participants to produce test results on samples taken by a sampler who is not working under the supervision / control of the authorized participant itself (e.g. because this sampler is working on remote facilities or in a different site abroad)

17.2 Each MLM site must comply with all relevant requirements of this scheme

17.3 Sampling of seed may be subcontracted to a sampler in the scope of a companies' ISTA accreditation

17.4 Sampling of soil may be subcontracted to a sampler who complies to all relevant requirements of this scheme, including participation in internal audits and organizational aspects

17.5 The participant must inform the Bureau Authorizations if they want to use the MLM option or if they want to subcontract sampling

## 18. Sampling of (parts of) plants

18.1 Requisites:

- The correct sampling equipment must be available (e.g. gloves, knife, disinfection, clean bags)
- The sampling equipment must be designed in such a way that it is possible to:
  - Sample and obtain a sample from every required type / piece of tissue
  - Clean it effectively afterwards (to avoid cross contamination)

18.2 It must be indicated and / or reference must be made regarding (along with the assignment):

- The required type / piece of tissue (e.g. stem, root, leaf, pollen, fruit) to be sampled
- The required stage / age of this tissue
- The size of the lot and / or plot (e.g. the number of mother plants per lot)
- The minimum / proportionate sample size (e.g. volume / weight / number)
- The sampling intensity (e.g. minimum number of primary samples per sample, lot and / or plot)
- The division of primary samples over the lot and / or plot (if relevant)

The above specifications for leaf material, pollen and fruits must comply with **Appendix I**

18.3 Regarding sampling:

18.3.1 Hygiene:

- The sampler must be able to draw a representative sample
- The sampler must have a clean work environment, including sampling equipment
- The sampler must avoid cross contamination between the several lots and / or plots which need to be sampled

18.3.2 Sampling method:

- The sampler must be able to draw every primary sample that is needed and how is needed (complying with **Appendix I**)
- The sampler must check all information on the assignment with information regarding the lot and / or plot, sample bag and circumstances in the field
- Every sample must be labelled with all relevant information

18.3.3 Irregularities:

- Irregularities (e.g. incorrect information) must be brought to the attention of a function which is appointed to manage such irregularities

18.3.4 There must be adequate administration, indicating or making a reference to the following information:

- The name and address and / or co-ordinates (e.g. client, location of the plot)
- The drawing of the plot and / or a scheme indicating the relation between sample and lot and / or plot (tracking & tracing)
- The assignment
- The crop and variety
- The lot and / or plot number
- The lot and / or plot size
- The number and identification of samples
- The sample size
- The relevant information / observations of the sampler
- The initials of the sampler

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- The date of sampling
- The tests which must be completed
- The test result

**19. Sampling of seeds**

19.1 Requisites:

- The correct / dedicated sampling equipment must be available (e.g. probes, triers, carts, bench, mixing equipment, clean bags)
- The sampling equipment must be designed in such a way that it is possible to:
  - Sample and obtain seed from almost every place in the unit
  - Clean it effectively afterwards (to avoid cross contamination)

19.2 It must be indicated and / or reference must be made regarding (along with the assignment):

- The maximum lot size per sample
- The minimum / proportionate sample size (e.g. volume / weight / number of seeds)
- The division of primary samples over the unit / lot
- The sampling intensity (e.g. minimum number of primary samples per sample, lot and / or plot)

The above specifications must comply with **Appendix I**

19.3 Regarding sampling:

19.3.1 Hygiene:

- The sampler must be able to draw a representative sample
- The sampler must have a clean working place (regarding sampling equipment) and
- The sampler must avoid cross contamination between the several lots that need to be sampled

19.3.2 Sampling method:

- The sampler must be able to draw each primary sample that is needed and how is needed (complying with **Appendix I**)
- The labels / information on every unit must be visible to the sampler
- The sampler must check all information on the assignment with info on the unit and sample bag
- Every sample must be labelled with relevant information

19.3.3 Irregularities:

- Irregularities (e.g. incorrect information, seed does not seem to be homogeneous) must be brought to the attention of a function that is appointed to deal with such irregularities, see also **Appendix I**

19.3.4 There must be an adequate administration, indicating or making a reference to the following information:

- The origin (producer / supplier) of the seeds
- The date of arrival
- The crop
- The variety
- The lot number
- The lot size
- The relation between sample and seed lot (tracking & tracing)
- The lot quality (stage of processing)
- The number of units
- The weight of the sample or number of seeds
- The relevant information / things the sampler noticed (e.g. when the lot appears not to be homogeneous, wet seeds, noxious weeds, etc.)
- The initials of the sampler
- The date of sampling
- The tests which must be completed
- The test result

**20. Sampling of soil**

20.1 Requisites:

- The correct / dedicated sampling equipment must be available (e.g. probe, clean bags, as well as clean boots)

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- The sampling equipment must be designed in such a way that it is possible to:
  - sample and obtain a sample from every required place
  - Clean it effectively afterwards (to avoid cross contamination)

20.2 It must be indicated and / or reference must be made regarding (along with the assignment):

- The division of primary samples over the plot
- The maximum plot size per (sub) sample: see table
- The minimum volume / weight obtained must be enough to test the submitted sample according the approved protocol or at least 1.2 litre
- The sampling intensity (e.g. minimum number of primary samples per area): see table
- Which layers must be represented in the sample (the depth of the stitches): see table
- The possible constraints, e.g.:
  - Sampling limited to a determined period only: see table
  - When it is that the collected sample will not be submitted as a whole, it must be mixed thoroughly, before taking the portion out of it that will be submitted
  - If sampling is performed for multiple tests at the same time, all requirements for individual sampling and tests have to be fulfilled. Samples have to be thoroughly mixed before testing.

| | Ditylenchus dipsaci and/or Sclerotium cepivorum | Longidorus spp. and/or Xiphinema spp. | Other nematodes (e.g. Meloidogyne spp., Pratylenchus spp., Trichodorus spp., Rotylenchus spp., Paratylenchus spp.) | Verticillium dahliae |
|---|---|---|---|---|
| Maximum plot size per sample | 2.000 $m^2$ | 2.000 $m^2$ | 20.000 $m^2$ | 20.000 $m^2$ |
| Minimum number of primary samples (stitches) per sample | 60 (1 stitch/max 33,3 $m^2$) | 60 (1 stitch/max 33,3 $m^2$) | 60 (1 stitch/max 333 $m^2$) | 60 (1 stitch/max 333 $m^2$) |
| Depth of stitches | 0-25 cm | 10-35 cm | 0-25 cm | 0-25 cm |
| Sampling period | - Previous crop onion: sampling allowed from 1 January – 1 April<br>- Previous crop beet: sampling allowed from 4 (four) weeks after harvest<br>- Other previous crops: sampling allowed from 1 October – 1 April | - After disinfection of soil: wait until 6 weeks after disinfection<br>- After tillage: wait one week<br>- Preferred periods: September-October and February-May | After disinfection of soil: wait until 6 weeks after disinfection | After disinfection of soil: wait until 6 weeks after disinfection |

20.3 Regarding sampling:

20.3.1 Hygiene:

- The sampler must be able to draw a representative sample
- The sampler must have a clean work environment, including sampling equipment
- The sampler must avoid cross contamination between the several plots which need to be sampled

20.3.2 Sampling method:

- The sampler must be able to take every primary sample that is needed
- The sampler must check all information on the assignment with information regarding the plot, sample bag and circumstances in the field
- The sampler must be able to take a representative sample

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    - Every primary sample (stich) must be represented in the submitted sample equally
    - The collected primary samples must be mixed thoroughly before pulling a submitted sample out of the composite sample (unless the composite sample is the submitted sample)
  - Every sample must be labelled with relevant information

20.3.3 Irregularities:

- Irregularities (e.g. incorrect information) must be brought to the attention of a function which is appointed to manage such irregularities

20.3.4 There must be an adequate administration, indicating or making a reference to the following information:

- The name and address and / or co-ordinates (e.g. client, location of the plot)
- The drawing of the plot indicating:
  - GPS (x-y co-ordinates) or of equal merit / relevant co-ordination points (ditches, bushes, farms, roads, neighbour crops, lot code, etc.)
  - Crop where the sampling is intended for
  - Direction of the north
  - 'Fixed point' (from where the first sample starts)
  - Nature of debris of previous crop, where relevant
  - Relation between sample and plot (for tracking & tracing)
- The assignment
- The plot number
- The plot size
- The number and identification of samples
- The volume / weight of the sample
- The relevant information / observations from the sampler
- The initials of the sampler
- The date of sampling
- The tests which must be completed
- The test result

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## 21. Facilities

21.1 The environment where the test is conducted must ensure that the results of the tests are reliable and that there is no negative influence on the required accuracy (of both measurements and testing itself)

21.2 If necessary, the participant must organize that testing facilities have additional protection against extraordinary conditions, such as extreme temperature, dust, moisture, steam, vibration, DNA-fragments, electromagnetic disturbance or interference, and must be maintained appropriately with specific attention to hygiene issues in order to prevent cross-contamination

21.3 Access to and use of all testing facilities must be controlled

21.4 The participant must offer sufficient space for the employees carrying out the work to make practical and accurate movements and also provide adequate health and safety provisions

21.5 The facilities must be equipped with appropriate instruments and power sources required for the tests

## 22. Applied protocols and testing

22.1 The participant must have suitable documents for the use and operation of all relevant equipment for handling and preparing samples (if applicable) and for accepted testing techniques according the scope

22.2 The participant must carry out the test according to by Bureau Authorizations approved protocols (either the Naktuinbouw standard protocol or an in house company method / protocol)

22.3 In case the number of seeds to be tested is lower than the minimum validated sample size in a seed health test:

- Previously tested negative seeds may be added to the sampled seeds to reach the validated sample size
- Samples from multiple seed lots may be combined prior to testing. In this case, the result (positive or negative) is valid for all seed lots represented in this sample
  - In case of a positive test result, seed lots can be retested as single lots to identify the infected seed lot(s)
  - When the infected seed lot(s) is identified, the remaining seed lots tested negative for the target pathogen can be regarded as free from the pathogen

22.4 New (or changes in earlier approved) in house company methods / protocols in the scope of the ASLN authorization must be assessed and approved by Bureau Authorizations through myNaktuinbouw, before taking them into use

22.5 When the participant is to the opinion that the already approved method / protocol (the one that is in force) is no longer fit for purpose and must be replaced by a next revision immediately, the following steps must be taken:

- The participant must inform Bureau Authorizations about this intention, indicating the reason why
- Bureau Authorizations will consult her expert for a quick scan a.s.a.p.
- Bureau Authorizations will inform the participant whether this request can be approved provisionally (if that provisional consent cannot be given, no claim can be set here)
- If this next revision has been approved provisionally, the participant can start issuing ASLN Laboratory reports if needed
- The next revision will be studied more carefully by our expert later on, and the participant will be informed about the outcome (as usual)
- When the new revision will be approved, everything is OK. But when the new revision cannot be approved, the results that are obtained with the new revision in the meantime cannot be regarded as valid anymore, so they must be withdrawn

22.6 The in house company method / protocol must indicate at least:

- Scope (pathogen / crop / matrix (seed, leaf, etc.) / test)
- Indication of the applied technique / method (plating, PCR, ELISA, UPT, germination (light / dark, temperature), etc.)
- Meaning of abbreviations
- Execution of the test (providing clarity (or making are reference to) where relevant for: used equipment, usage of equipment, (sub-) sample size, the making of a working- or subsample, weighing, purifying, drying, back weighing, fractions (unharmful impurities, other seeds, pure seeds, etc.), counting days, grinding, spin (in g), number of isolates,

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primer sequences, kits (type and supplier), antibodies (supplier), reagents, buffer composition, medium composition, positive-/negative controls, warnings, etc.)
- Decision scheme describing the criteria to define the test result (extinction / Ct threshold, reaction of controls standard (normal, abnormal, not germinated), calculation of results, closing / repeating, etc.)
- Reference to literature (where relevant)
- In case of revisions: a log indicating the changes to all former versions. All changes to the last accepted version have to be marked in the text, or the revision log must be complete in all details (except changes in formatting)

22.7 For approval: if the participant has chosen for a structure in modules, all relevant modules have to be sent to Bureau Authorizations for making an appropriate evaluation possible. Documents describing the execution of the test as well as the decision scheme need to be included and need to be evaluated. Documents describing supporting processes (e.g. preparation of buffers or antibiotics, qualification matrix of personnel) can be included for clarification of a protocol, but do not need protocol review in itself.

22.8 For approval:

22.8.1 For seed analysis:
- For new protocols: supporting data demonstrating the reliability and reproducibility of the method is required. Supporting data can consist of a comparison between the old and new situation, reproducibility of the method and/or the experiments performed in the development of the method. For previously approved protocols which have been up-dated:
  - If it involves a major change (such as changes in light, temperature or moisture conditions, laboratory facilities, substrate, crop or seed treatment): supporting data is required
  - If it involves a minor change: supporting data is not required
  - If it involves a textual change or editorial without consequences for the test result: the protocol is sent to Bureau Authorizations, but no further review is necessary

22.8.2 For seed health / soil health / plant health testing:
- For new protocols: a validation file is required
- For previously approved protocols which have been up-dated:
  - If it involves a minor change: a comparison / experiment in which the old and new situation are compared with each other is sufficient
  - If it involves a major change (e.g. when changing media): a validation file is required
  - If it involves a textual change or editorial without consequences for the test result: the protocol is sent to Bureau Authorizations, but no further review is necessary.

22.8.3 A validation file consists of:
- Validation protocol
- Validation report
- Data dossier (raw data)

22.8.4 The participant must determine the requirements for the testing protocol (e.g. minimal sensitivity, specificity), prior to validation

22.8.5 Validation consists of determination of the relevant performance criteria as described in EPPO Standard PM 7/98:
- Analytical sensitivity
- Analytical specificity: inclusivity
- Analytical specificity: exclusivity
- Selectivity
- Repeatability
- Reproducibility
- Robustness

22.8.6 The validation report consists of:
- The testing protocol which has been validated
- Scope
- Relevant performance characteristics (together with a plausible explanation when certain performance characteristics have not been applied)

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- Conclusion whether:
  - The requirements have been met
  - The protocol is fit for its purpose

22.9 The participant must identify the need for and if necessary apply statistical techniques required for determining, managing and verifying test results

22.10 There must be adequate planning, including the priority of tests, availability of staff and facilities/equipment, to ensure that the testing is carried out under controlled conditions

22.11 At all stages of storage, handling and preparation of samples measures must be taken to prevent damage and/or deterioration that would make results invalid

22.12 Anonymity of samples must be ensured as far as possible in order to prevent any influence on the results. The participant must ensure that evaluation of tests can be done without information about the background (origin, complaints, etc.) only, e.g. by coding, in order to avoid preoccupation that could influence test results (to ensure impartiality)

22.13 If the test shows abnormalities and / or deviates from what is expected, management must be informed and appropriate action undertaken, possibly leading to a CAR (see 10)

22.14 The results of testing (of the samples) are compared with the original sampling schedule, for inspection of completeness of sampling and analysis

22.15 The lab technician evaluating the test must not have any interest in the outcome or result of the test

22.16 There must be full traceability at all stages in the process (e.g. from receiving and sampling of the seed lot, handling samples, storage of samples, the conducting of all tests, all test evaluations and all ASLN Laboratory reports issued)

22.17 It is not allowed to test a soil sample from a plot that has been tested before in the same year

## 23. Subcontracting

23.1 If an ASLN participant wishes to subcontract a test to Naktuinbouw Laboratories, with the intention to issue an ASLN Laboratory report based upon a test result obtained from Naktuinbouw Laboratories, this is allowed.

23.2 If an ASLN participant wishes to subcontract a test to another ASLN or NAL participant, with the intention to issue an ASLN Laboratory report based upon a test result obtained from the other ASLN or NAL participant, this is allowed as long as the other ASLN or NAL participant has the test in their scope of authorization.

23.3 If an ASLN participant subcontracts a test to another laboratory, with the intention to issue an ASLN Laboratory report based upon a test result obtained from this subcontracted laboratory this is allowed when the subcontracted laboratory has an accreditation for NEN-EN-ISO 17025. Condition 5.7 is applicable.

This subcontracted laboratory must:

23.3.1 Have the subcontracted test in their scope of accreditation.

23.3.2 Have the proof of accreditation and results from relevant audits available for Bureau Authorizations.

23.3.3 Have the protocol for the concerning test and its revisions approved by Bureau Authorizations. The protocol must be written in Dutch or English

23.3.4 Take part in proficiency testing between laboratories for the concerning test when organized by Bureau Authorizations and inform the ASLN participant when a minor or major is issued. Condition 25.3 is applicable.

The ASLN participant must:

23.3.5 Inform Bureau Authorizations about the test and subcontracted laboratory it will use, independent from incidental or structural subcontracting.

23.4 When the above is satisfied, it is allowed to issue an ASLN Laboratory report based upon a test result obtained from this subcontractor (including Naktuinbouw or another ASLN or NAL participant), provided that on the Laboratory report is stated: ‘test result obtained from an approved subcontractor’. When the subcontractor belongs to the same holding such additional information on the ASLN Laboratory report is not obligatory.

## 24. ASLN Laboratory reports

24.1 Bureau Authorizations must approve the procedure (and related documents) for issuing ASLN Laboratory reports through myNaktuinbouw, before ASLN Laboratory reports can be issued

24.2 The participant can only issue ASLN Laboratory reports if:

24.2.1 The sample is taken in compliance with the ASLN Conditions, including 15.9

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24.2.2 The test result is based upon fully completed tests compliant with the ASLN Conditions
24.2.3 The test has been carried out according to approved protocols for which the participant is authorized
*24.2.4 Not applicable for ASLN*
*24.2.5 Not applicable for ASLN*

24.3 When the participant receives a major (due to the results of a proficiency test), the authorization for the relevant test is temporarily withdrawn, in such cases it is no longer permitted to issue a ASLN Laboratory report for this test, until written permission is given by Bureau Authorizations, showing explicitly that authorization for the test has been granted again

24.4 The ASLN Laboratory report must contain the following information:
- The participant's name and address and / or trade mark of the ASLN authorized participant (reference to other brand names is not allowed)
- A clear identification / reference to the subject that has been tested
- Test result
  - Germination and UPT: written in integers
  - Purity:
    a. report with one decimal
    b. report traces (written as TR) in case percentage is between 0.00 and 0.05% and add description of kind of inert matter or other seeds
  - Seed count: in kg or grams
- The initials of the person responsible for the content
- The date of issue
- It is allowed to make a reference to ASLN authorization
- It is allowed to give additional information (e.g. of the client, whether the seed has been treated, etc.)

24.5 An ASLN Laboratory report must not contain any advice or recommendation (even when based upon the test result)

*24.6 Not applicable for ASLN*

24.7 In the event a test result issued with the ASLN Laboratory report is incorrect, the ASLN Laboratory report must be retrieved from the recipient and replaced with a new ASLN Laboratory report with the correct test result

24.8 In the event authorization is withdrawn with a retrospective effect (even when temporary), the participant must determine if a recall or informing clients is necessary

24.9 If the participant wishes to issue an ASLN Laboratory report with a test result for seed analysis:
- There have to be tested 400 seeds as a minimum
- The result between repetitions must not exceed the allowed deviation as indicated in internationally accepted tolerance tables

## 25. Monitoring test quality

The participant must ensure the quality of test results over time.

25.1 Test

25.1.1 The participant must draw up a program for monitoring test quality and register the results of this monitoring.

25.1.2 At least one of the following must be implemented (except when released of this condition by Bureau Authorizations, in cases where this is not relevant):
- positive and negative controls must be used with all replicate tests
- testing of blind samples with known infection/germination levels
- replicate testing of the same sample with the same method

25.2 Internal ring test

25.2.1 The participant must draw up a program for internal ring tests, to demonstrate the individual expertise of the lab technicians regarding evaluation of the concerning tests. Internal ring tests should be inherent to the end result, should guarantee reproducibility and focus on the variable part of assay

25.2.2 The participant must make a program for 3 years, based upon the scope

25.2.3 Categories

25.2.3.1 Each test within the participant's scope for seed analysis will belong to one of the categories as mentioned under 25.2.4

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25.2.3.2 Each test within the participant's scope for seed health / plant health will belong to one of the categories as mentioned under 25.2.5

25.2.3.3 Each test within the participant's scope for soil health will belong to one of the categories as mentioned under 25.2.6:

25.2.3.4 Each category that is relevant for their scope for ASLN must be completed at least annually

25.2.3.5 Each test that is within their scope for ASLN must be completed at least once per three years

25.2.3.6 If this leads to a very high number of internal ring tests for the same group of lab technicians a risk-analysis can be performed to show that a lower frequency is acceptable.

25.2.3.7 For germination and UPT: tests of crops of which the seedlings can hardly be distinguished from each other and which have the same evaluation criteria (e.g. pepper and hot pepper) can be considered as one test when drawing up the program for internal ring tests

25.2.3.8 For physical purity and other seeds: tests of crops which have the same definition of pure seed can be considered as one test when drawing up the program for internal ring tests

25.2.4 Categories for seed analysis; examples per category are an indication and not exhaustive:

- Category A: Physical purity, Determination of other seeds
- Category B: Thousand seed weight, when executed manually
- Category C: Moisture, when executed manually
- Category D: Germination and UPT of monocotyledons with primary root essential for evaluation, e.g. Allium, Asparagus, Freesia
- Category E: Germination and UPT of monocotyledons with secondary roots that may compensate primary roots, e.g. Zea
- Category F: Germination and UPT of dicotyledons with primary root essential for evaluation, e.g. Anethum, Apium, Beta, Borago, Brassica, Capsicum, Cichorium, Coriandrum, Daucus, Foeniculum, Fragaria, Lactuca, Pastinaca, Petroselinum, Raphanus, Scorzonera, Solanum, Spinacia, Thymus
- Category G: Germination and UPT of dicotyledons with secondary roots that may compensate primary roots, e.g. Cucumis, Cucurbita, Helianthus, Phaseolus, Pisum, Vicia
- Category H: Germination and UPT of dicotyledons with several equal seminal roots, e.g. Cyclamen

25.2.5 Categories for seed health / plant health:

25.2.5.1 Categories for bacteria:

- Dilution plating and identification of suspected colonies
- Grow out (sweat box or green house)
- Molecular assays (BioPCR /seed extract PCR)
- Other

25.2.5.2 Categories for viruses / viroids:

- ELISA
- Bio assay
- Molecular assays (RT-PCR )
- Other

25.2.5.3 Categories for fungi:

- Agar plating
- Blotter
- Grow out
- Other

25.2.6 Categories for soil health:

- Nematodes
- Fungi
- Other

25.2.7 This program for internal ring tests must be based upon other relevant aspects as well, including e.g. outcome of earlier internal ring tests, proficiency tests, relevant CARs and process performance / product conformity

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25.2.8 Each lab technician that is responsible for evaluation of those tests is obliged to participate in the internal ring tests

25.2.9 If in a certain case obliged participation is not possible (for any reason whatsoever), the participant must consider and determine in each case whether the concerning employee can be maintained as an evaluator for the concerning test (one of the considerations must be whether it is necessary to have the results confirmed by another lab technician)

25.2.10 Before the internal ring test can be started, criteria must be set, dealing with e.g. (when and where relevant):

- The object that needs to be recognized
- The percentage of the object that needs to be found
- The allowed deviation between the lab technicians from average and which relevant table will be used to determine this
- It is also possible that 'average' will be determined after the test and after discussion with participants

25.2.11 When deviation between participants is larger than acceptable, the participant must draw up a CAR (see 10). Drawing up a CAR may not be needed when a re-test shows a good result

25.3 External proficiency tests

25.3.1 Each participant is obliged to take part in external proficiency tests (or testing of a blind sample) when organized by Bureau Authorizations, for those tests that are within their scope for ASLN

25.3.2 Participation in other proficiency tests is encouraged

25.3.3 In the event of a minor or major, the participant must:

- Draw up a CAR (see 10)
- Inform Bureau Authorizations about the outcome of this within two months (minor) or two weeks (major)

25.3.4 In the event of a major:

- The authorization for the concerning test will be withdrawn temporarily
- Until resolved, it is not possible for the participant to issue ASLN Laboratory reports for this test on any possibly affected seed lot, or state otherwise that possibly affected seed lots are healthy
- The participant must determine if a recall or informing clients is necessary
- Bureau Authorizations will inform within two weeks after receiving the corrective action if authorization for this test can be granted again

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## MISCELLANEOUS

### 26. Definitions / references

26.1 Abbreviations:

- ASLN: Authorized Service Laboratories Naktuinbouw
- CAR: Corrective Action Request
- DAFF: Department of Agriculture, Fisheries and Forestry
- ELISA: Enzyme-Linked Immuno Sorbent Assay
- EN: Europese Norm (European Standard)
- EPPO: European Plant Protection Organization
- ISHI: International Seed Health Initiative
- ISO: International Standardization Organization
- ISTA: International Seed Testing Association
- MLM: Multi Location Module
- Naktuinbouw: Netherlands Inspection Service for Horticulture
- NAL: Naktuinbouw Authorized Laboratories
- NC: Non Conformity
- NEN: Nederlandse Norm (Dutch Standard)
- PCR: Polymerase Chain Reaction
- PT: Proficiency Test
- QMS: Quality Management System
- UPT: Usable Plant Test (see 26.4)

26.2 QMS

- Scope: the total of all tests for which ASLN authorization has been granted, as stated on the ASLN authenticated register of tests
- Procedure: a document (can be either digital or a hard copy, either in a flowchart or in wording) indicating the flow (of a part) of the laboratory's process, along with the responsibilities and remarks (reference to documents, relevant time frames) per process step. Answering the question who does what, where and when. Also about the competencies and responsibilities for the relevant tasks / process steps. It is relevant to distinguish:
  - The responsible function for a process step (e.g. initiating, coordinating, delegating work to competent employees, compliance with requirements/procedure, etc.)
  - The function involved in completing the task/process step (responsible for their work)
  - The function which must be consulted during a process step
- Work instruction: a document (can be either digital or a hard copy) that describes how a specific part of the laboratory's process must be executed, when there is a risk that absence of this can lead to significant variation and that the process will not be adequately controlled.
- Process owner: the individual (function, employee or manager) responsible for control of the process (e.g. initiation, flow, appointing staff, training).
- Impact analysis: next to an analysis of the root cause (the basic cause or core issue of a problem) one should analyze the impact. At least two questions must be posed: The problem seen at "this point x", can it happen at "point y" too? What was the effect of the problem on previous tests?
- MyNaktuinbouw: online tool through website Naktuinbouw for protocol review
- Critical control point:
  - A specific step (in a procedure, instruction or protocol) for which the laboratory has determined that control is critical to the outcome of the process
  - That therefore needs to be monitored, in order to reduce, eliminate or prevent the possibility that it will not be controlled
  - Applicable and relevant
- Primary process: the chain of activities (like for ASLN: sampling and testing) that must be carried out in order to be able to deliver a result / product to an internal or external customer; this must be seen in relation to the scope of the concerning scheme / existence of a business (like for ASLN: a test result; for a seed company: a bag of seeds)
- Secondary process: all other activities that are supporting the primary process (like: calibration, document control, internal auditing, training of staff)

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26.3 Equipment, means, devices and reference materials

- Accuracy: measure of statistical bias (how close or far off a given set of measurements (observations or readings) are to their true value) with a description of systematic errors
- Adjustment: adjusting the device within appropriate tolerances, ensuring the metrological performance, and making it fit for purpose (again)
- Calibration:
  - Determining the value of the deviation of a device from a calibration instrument
  - Where it consists of:
    - Applying test loads to the device under specified conditions
    - Determining the error and/or variation of the indication and
    - Evaluating the uncertainty of measurement to be attributed to the ASLN test results
- Calibration instrument:
  - The standard, known to have a valid reference to (inter)nationally recognized standards (if possible or feasible) and
  - The means intended to conduct calibration of a device; this is understood to mean both a material measure as well as a measuring device
- Deviation: difference between the calibration instrument (e.g. regarding indicated temperature, wavelength, dispensed volume or the control weight used) and the corresponding settings or reading on the device that needs to be calibrated, including possible systematic and random errors
- Device: apparatus / device / equipment / instrument / machine used in a process under NAL authorization, which needs to operate within certain tolerances to enable a controlled process and therefore needs to be calibrated at certain intervals
- Precision: measure of statistical variability (how close measurements are together) with a description of random errors
- Tolerances: permissible deviation from a certain temperature, wavelength, volume or weight, because the permissible deviation does not or hardly affect the outcome of the intended use / concerning test
- Uncertainties: uncertainties as determined by publication reference EA-4 02 from the European co-operation for accreditation; in short: addition of possible systematic and random errors

26.4 Sampling and testing

- Batch of seeds: an amount of seeds, produced within one process step all at one time (like: cleaning, grading, enhancing) / delivered, and which can be considered as one relatively homogeneous unit / quantity of seeds
- Test: method (from A – Z, see ASLN Condition 22.5), laid down in an unambiguous protocol (so written that an appropriately qualified person can perform the complete test), for which authorization has been granted:
- Seed analysis:
  - germination (see NAL Quality score): crop / method
  - moisture
  - physical purity
  - other seeds
  - thousand seed weight / seed count
- Seed health determination: pathogen / crop
- Plant health determination: pathogen / crop
- Germination test: determination of the emergence and development of seedlings grown under optimal circumstances where all essential structures (root system, hypocotyl/epicotyl and cotyledons/coleoptile) can be evaluated
- Usable plant test: determination of the development of seedlings grown under sub-optimal (practical) circumstances where at least the cotyledons and/or the first real leaf can be evaluated
- Physical purity test: determination of the percentage of pure seeds, the percentage of inert matter and the percentage of other seeds. Often combined with determination of other seeds.
- Determination of other seeds: test in which the number of other seeds is reported per species or genus. Often combined with a physical purity test, but on a (in general 10 times) larger amount of seeds.

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- Protocol: a document which describes how a test needs to be conducted, by indicating the consecutive steps and also (where necessary) the different roles / responsibilities; in case the participant has divided a test into distinctive parts (modules), the protocol must indicate how this all together is build up; this must be in line with requirement 22.5

26.5 Monitoring test quality

- ASLN Proficiency testing: a test of skill and an evaluation of the capability of an ASLN authorized laboratory to achieve a correct test result for the tests for which it is authorized, by a system to objectively compare the laboratory's results with other laboratories' results by an independent organization (e.g. Bureau Authorizations). The main objective being the establishment of trueness. This is achieved by using the laboratory's personnel, materials, equipment, environmental conditions and quality management system, through the analysis of (to the participating laboratory) unknown specimens, prepared and distributed by an external source (e.g. Bureau Authorizations). An 'external check', a third line control.
- Internal ring test: a test to see to what extend all lab technicians within a laboratory (that are 'mature' and responsible regarding evaluation of a test) are coming to more or less similar test results when evaluating the same sample. An 'internal check', a second line control.
- Blind sample: a sample from a lot that has been tested in an earlier stage, and that is brought to the laboratory (again) on purpose, to see whether the laboratory comes to the same / expected test result. This can be organized internally (→ second line control) or externally (→ third line control). Constraint: the blind sample must fit in the routine flow of testing, so that a lab technician does not have a clue that he / she is dealing with a blind (**!**) sample.
- Major: notification by Bureau Authorizations to a participant whose results in a ASLN proficiency test demonstrate an underperformance based on statistical analysis.
- Minor: notification by Bureau Authorizations to a participant whose results in a ASLN proficiency test indicate a (minor) deviation based on statistical analysis.

## 27. Revision history (ASLN Conditions 2025 v12 compared to ASLN Conditions 2024 v11 and ASLN Conditions 2025 v12.1 compared to ASLN Conditions 2025 v12)

**ASLN Conditions 2025 v12 compared to ASLN Conditions 2024 v11**
We made the following changes through the document:

Introduction
Reference to Appendix I deleted. Added 'regeling verhandeling teeltmateriaal'

2.1
Added: where

4.3 split in 4.3.1 and 4.3.2
4.4 split in 4.4.1 and 4.4.2

7.2
For at least 7 years changed in: The period of keeping records may differ, but

- local legal obligations must be fulfilled
- must be kept for at least 5 years, unless local legal obligations prevent this

10.3
Added: and the impact

13.4, 13.5 and 13.6
Deleted, added and replaced some text: most important elements:

- Added to Acceptance / release: …based on tests. Before the test can be started, criteria must be set, dealing with the allowed tolerance
- Added to draw up a CAR: …in the period until the previous calibration
- Added to calibration by an accredited subcontractor: In case a very high accuracy of the device is needed, the participant should ensure itself that the subcontractor uses sufficiently accurate calibration instruments.

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- Deviation of the calibration instrument must be max 10% of the tolerances as determined for the device that needs to be calibrated: only for non-accredited subcontractors or internal checks

14.2 and 14.3
Replaced some text from 14.2 to 14.3 and vice versa.
14.2 bullet 2 added ‘Before the test can be started, criteria must be set, dealing with the allowed tolerance’

16.2.1, 16.2.2 and 16.2.3
Added that the training has to be approved ‘through myNaktuinbouw’

17
Added ‘and subcontracting of sampling’
17.1 added ‘The multi location’
17.3 and 17.4 are new
17.5 added or if they want to subcontract sampling

22.4
Added: ‘in the scope of the ASLN authorization’ and ‘before taking them into use’, instead of ‘prior to issuing ASLN Laboratory reports’

23.3
Reference 5.8 changed into 5.7

24.4
Deleted ‘at least’
Added: third bullet ‘or information on the seed lot’
24.9
Germination changed into seed analysis

25.2.3
Splitted in 25.2.3.1 to 5. Added 25.2.3.6 to 8:
25.2.3.6
If this leads to a very high number of internal ring tests for the same group of lab technicians a risk-analysis can be performed to show that a lower frequency is acceptable.
25.2.3.7
For germination and UPT: tests of crops of which the seedlings can hardly be distinguished from each other and which have the same evaluation criteria (e.g. pepper and hot pepper) can be considered as one test when drawing up the program for internal ring tests
25.2.3.8
For physical purity and other seeds: tests of crops which have the same definition of pure seed can be considered as one test when drawing up the program for internal ring tests
25.2.4
Changed some categories for seed analysis
25.2.11
Added: Drawing up a CAR may not be needed when a re-test shows a good result
25.3.1
Added 25.3.1.1: Participation in the NAL proficiency test Physical purity / Determination of other seeds is obligatory when the species is in the scope of the participant

26.1
Abbreviation UPT (see 27.4)
26.2
Added: Impact analysis.
26.4
Added:
- Germination test: determination of the emergence and development of seedlings grown under optimal circumstances where all essential structures (root system, hypocotyl/epicotyl and cotyledons/coleoptile) can be evaluated.

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- Physical purity test: determination of the percentage of pure seeds, the percentage of inert matter and the percentage of other seeds. Often combined with determination of other seeds.
- Determination of other seeds: test in which the number of other seeds is reported per species or genus. Often combined with a physical purity test, but on a (in general 10 times) larger amount of seeds.

Changed:

- Usable plant test: determination of the development of seedlings grown under sub-optimal (practical) circumstances where at least the cotyledons and/or the first real leaf can be evaluated.

26.5

Deleted at major and minor reference to yellow card and red card.

**New Appendix I** Sampling intensity and other requirements

**ASLN Conditions 2025 v12.1 compared to ASLN Conditions 2025 v12**

- Changed link ‘Regeling verhandeling teeltmateriaal’
- 25.2.4 Cucumis and Helianthus deleted in F (only applicable for G)
- Added page 3 in Appendix I

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## APPENDIX I SAMPLING INTENSITY AND OTHER REQUIREMENTS

1. **Sampling of leaf material of mother plants to determine the seed health status**
   Samples must be collected according to an approved sampling strategy. Samples must be representative; every primary sample must be represented in the submitted sample equally.
   - 1.1 The stage and type of plant material must be relevant for the produced seed
   - 1.2 In case of seed productions of up to 10 mother plants, all mother plants must be sampled
   - 1.3 In case of seed productions of more than 10 mother plants, at least 10% of the mother plants must be sampled, with a minimum of 10 and a maximum of 200 plants per line and/or compartment
   - 1.4 In case of compartment sampling, at least 10% of the mother plants must be sampled, with a minimum of 10 and a maximum of 200 plants

2. **Sampling of leaf or other plant material for plant health testing**
   Samples must be collected according to an approved sampling strategy. Samples must be representative; every primary sample must be represented in the submitted sample equally.
   - 2.1 The stage and type of plant material must be relevant for the pathogen to be tested
   - 2.2 In case of plant numbers of up to 10 plants, all plants must be sampled
   - 2.3 In case of more than 10 plants, at least 10% of the plants must be sampled, with a minimum of 10 plants and a maximum of 200 sampled plants per line and/or compartment
   - 2.4 In case of compartment sampling at least 10% of the mother plants must be sampled, with a minimum of 10 and a maximum of 200 plants

3. **Sampling of pollen for pollen (plant) health testing**
   - 3.1 The sample must be taken after drying of the pollen
   - 3.2 Pollen must be mixed thoroughly before the sample is taken
   - 3.3 Per male line, 10% of the volume or weight must be sampled, with a maximum of 200 µl pollen
   - 3.4 Multiple small pollen samples may be combined up to a volume of 200 µl. In this case, the result (positive or negative) is valid for all pollen samples represented in this volume
   - 3.5 In case of compartment sampling, a relative (to the number of male plants in that compartment) representative sample size (volume or weight) of each pollen lot must be sampled to create a sample with a minimum volume of 200 µl (per compartment)

4. **Sampling of fruits for seed health testing**
   - 4.1 At least one fruit must be collected from each individual plant from which seeds will be harvested
   - 4.2 The collected fruit should contain mature or close to mature seeds and should be the upper fruit (or originate from the upper truss) that meets this criterium
   - 4.3 The fruit should be collected at the time of harvest or after final harvest of the seeds.
   - 4.4 A sample for testing shall be taken from the seeds extracted from these fruits according to Table 1

| | **Sample size** |
|---|---|
| Bacteria | Minimal 10 seeds per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |
| Virus/Viroid | Minimal 3 seeds per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |
| Fungi | Minimal 1 seed per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |

Table 1: Submitted seed samples for testing from fruits

   - 4.5 The test result is valid only for seeds harvested before or at the time of fruit collection. A new sample is required for seeds harvested after this moment

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## 5. Seed sampling of seed lots larger than 30.000 seeds

5.1 When a seed lot has been received from a third party (e.g. when bought or received from production):

5.1.1 Each unit needs to be sampled, with a minimum of one primary sample per unit

5.1.2 Furthermore Table 2 is applicable (because of the minimal number of primary samples to be taken for e.g. 1-4 units)

5.2 When a seed lot is known to be completely homogeneous (at least, regarding appearance), e.g. after thorough mixing during the cleaning or pelleting process:

5.2.1 Taking of one primary sample per unit / batch is sufficient

5.3 When a seed lot has been received from another department / site of the company itself (e.g. after cleaning or enhancement and / or when ready for shipment to customer):

5.3.1 The minimum number of primary samples to be taken in relation to the number of units / kilograms of the seed lot is indicated in Table 2:

| Units < 100 kg | | | Units ≥ 100 kg | | |
|---|---|---|---|---|---|
| **Number of units in the lot** | **Number of units to be sampled** | **Minimal number of primary samples** | **Lot size in kilograms** | **Number of primary samples** | **Min. number of primary samples** |
| 1 / 4 | each unit | 3 / unit | 100 / 500 | 5 | 5 |
| 5 / 8 | each unit | 2 / unit | 501 / 3.000 | 1 / 300 kg | 5 - 10 |
| 9 / 15 | each unit | 1 / unit | 3.001 / 20.000 | 1 / 500 kg | 10 - 40 |
| 16 / 30 | 15 | 15 (1 per sampled unit) | ≥ 20.001 | 1 / 700 kg | 40 |
| 31 / 59 | 20 | 20 (1 per sampled unit) | | | |
| ≥ 60 | 30 | 30 (1 per sampled unit) | | | |

Table 2: number of primary samples depending on number and size of units / lots

5.3.2 In case of irregularities (e.g. a less homongeneous appearance), Table 2 is still applicable, but all units must be sampled.

5.4 When it involves seed lots in small units (under 15 kg capacity), the units (e.g. 20 units of 5 kg or 100 units of 1 kg) can be combined into one compound unit, which altogether cannot exceed 100 kg.

5.5 When it concerns seed mats, tapes, small packets or reels, the units can be combined into one compound unit, which must not exceed 2 million seeds

5.6 For each compound unit, sampling must be carried out as indicated in Table 2 (e.g. for a compound unit existing out of 20 units of 5 kg, at least 3 primary samples must be taken)

5.7 The sampler must be able to draw a representative sample:

5.7.1 To avoid systematic errors, the sampler must change the place of sampling between the different units regularly (e.g. different layers; near the wall / in the centre; different angles)

5.7.2 Every unit must be represented in the submitted sample equally

5.7.3 The primary samples collected must be mixed thoroughly before taking a submitted sample out of the composite sample

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## 6. Seed sampling of small seed lots

6.1 Sample sizes for individual seed lots are in accordance with Table 3

| **Lot size:** | **≤150 seeds** | **151 - 300 seeds** | **301 - 3.000 seeds** | **3.001<seeds<30.000** |
|---|---|---|---|---|
| **Minimum infection rate to be detected:** | **10%, with 95% probability** | **10%, with 95% probability** | **10%, with 95% probability** | **1%, with 95% probability** |
| **Bacteria** | 5 seeds | 15 seeds | 30 seeds | 300 seeds |
| **Virus/Viroid** | 5 seeds | 15 seeds | 30 seeds | 300 seeds |
| **Fungi** | 5 seeds | 15 seeds | 30 seeds | 200 seeds[2] |

Table 3. Minimum test sample sizes for small seed lots.
Calculated sample sizes are based on hypergeometric distribution (ISPM No. 31- Methodologies for sampling of consignments (2008)). Data supporting the infection rates are presented in the Questions section of https://www.naktuinbouw.com/inspections/erkenningen/nal.

6.2 If all seed lots are harvested from one compartment in the same harvest period, seed sampling per compartment (paragraph 7) can be applied

## 7. Seed sampling per compartment

7.1 There must be a complete registration for each compartment that contains the number and identity of the lines, number of mother plants at time of harvest, and dates of harvests of the compartment

7.2 From each harvest a unique seed lot is made per line

7.3 A random sample must be taken from each seed lot. The sample size from this small lot is based on the number of mother plants from which the lot is produced, and according to Table 4.

| | **Sample size** |
|---|---|
| Bacteria | Minimal 10 seeds per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |
| Virus/Viroid | Minimal 3 seeds per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |
| Fungi | Minimal 1 seed per mother plant, maximum (but not limited to) the number of seeds used for seed lots of >30.000 seeds |

Table 4: Submitted seed samples for testing from a compartment

[2] *The 200 seed sample is a generally accepted sample size for seed health testing for fungal seed transmitted pathogens.*

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