GSPP
Good seed and plant practices

Annex 14.5

Technical requirements of the GSPP-Standard

Version 5.1

Valid from 11th December 2017Applicable from 1st January

I-17-2698

History of changes

Version	Chapter	Changes
5.0 & 5.0.1 (follows 4.1)	1.	Wording changes
	2.	Changes & wording added
	3	Changes & wording added
	4.2	Changes
	4.4	Wording changes
	4.12	New chapter
	5.9	Wording added
	5.10	Changes
	5.11	Changes
	5.13	New chapter
	5.14	Was previously 5.13 & changes
	6.2	Word deleted
	7.8	Deleted; was 7.9
	7.9	Was 7.10
	7.10	Was 7.12
	7.11	Deleted; was 7.13
	7.12	Was 7.14; wording added
	8	New chapter
	9	New chapter
	10	New chapter
	11	Was 8; changes
	12	Was 9; word change
	13	Was 10; changes; new chapter
	14	Was 11; word changes
	15	Was 12; content deleted, written in GSPP Standard

The participant must demonstrate his ability to meet the following requirements:

1 Water

The use of water within the GSPP system is allowed as follows:

- Surface water is never allowed to be used without disinfection.
- Applying water to plants and sown seeds:
  - All water has to be tested at least twice a year.
  - Well water or potable water may be used without disinfection in case of a "closed system". A closed system for water storage is considered as green area. (Rain) Water cannot enter the storage without passing a red lock (it has to be covered by a roof; netting is not sufficient).
  - Water in non-closed systems must be disinfected.
  - If drain water is reused in a green area it needs to be disinfected to separate entities.
- Water used for other processes:
  - Well or potable water may be used without disinfection.
  - Potable water may be used without testing.
  - If water is reused it needs to be disinfected to separate entities.
  - Other water sources need to be tested

As there is no specific reliable test currently available for *Cmm*-detection in water, the CFU test is used (with a threshold <1500 total CFU/ml) and an option of pre-screening with an IDEXX test. In case of positive IDEXX proceed with Quanti-tray or lab test (both <1500 total CFU/ml).

For the abovementioned situations, the testing methods and the thresholds are explained in the flow charts below.

Figure 1. Flow chart: applying water to plants and sown seeds

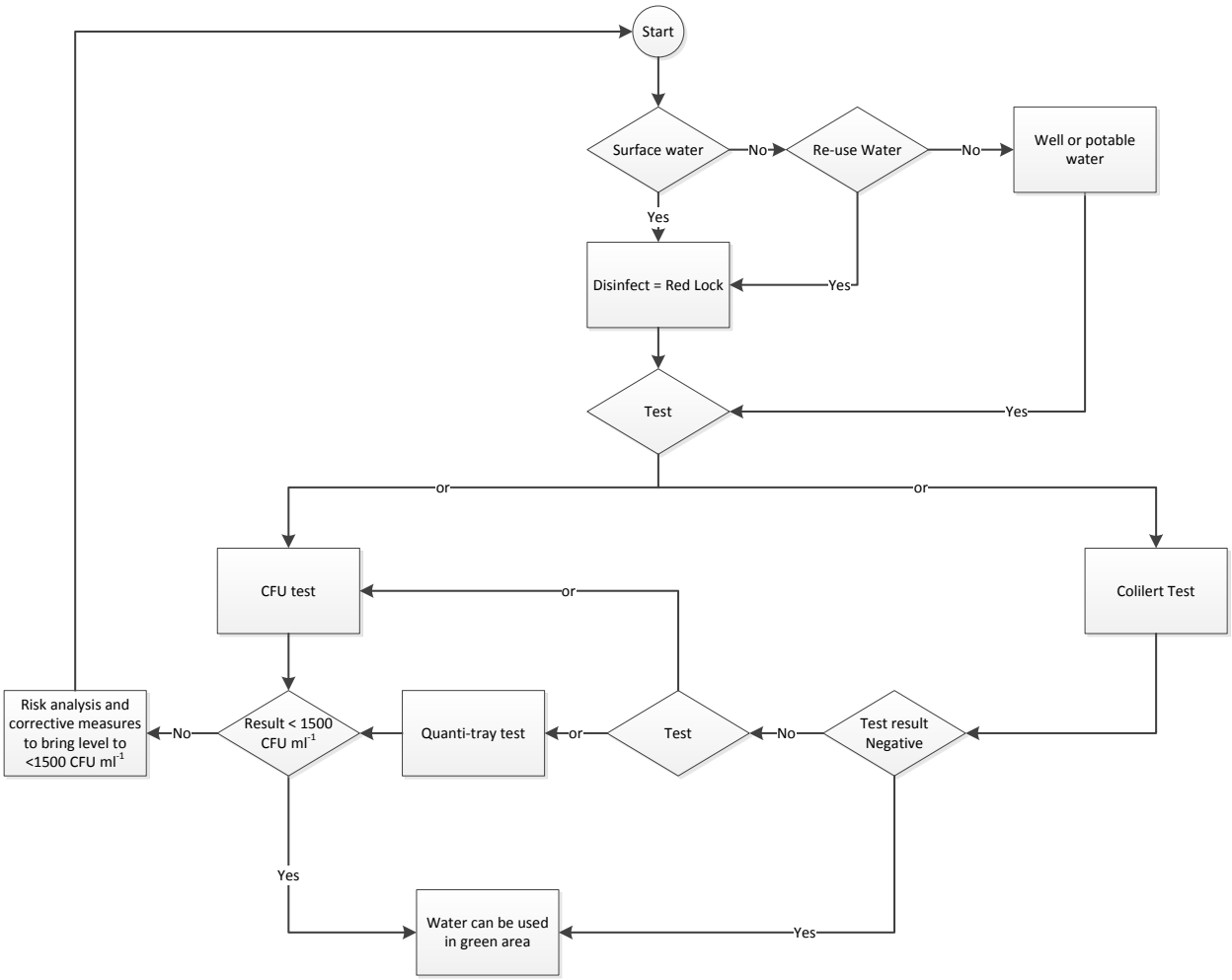
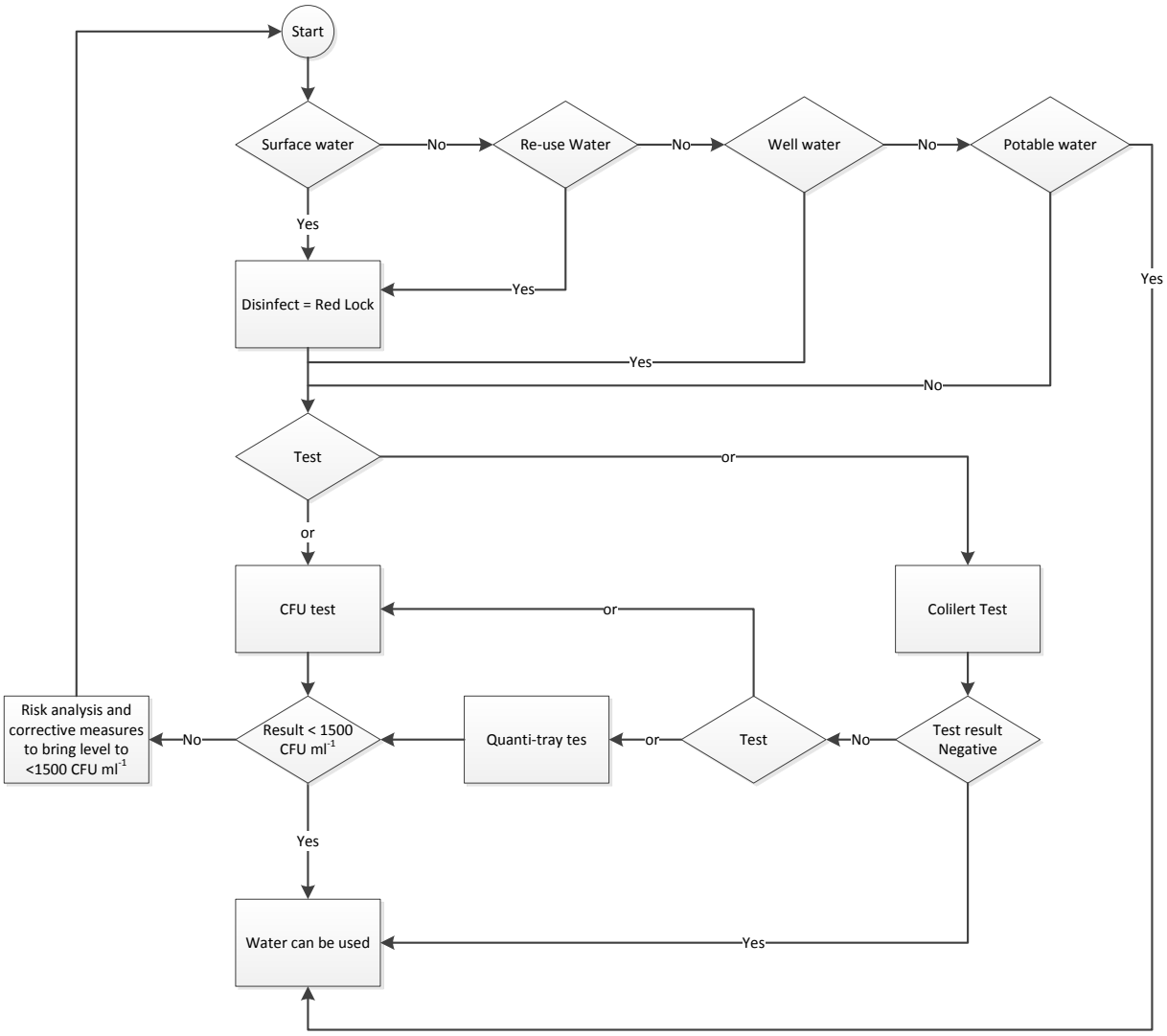


Figure 2. Flow chart of water for other processes.



2 Disinfection

- Methods for material / soil disinfection: Any disinfectant or cleaning chemical can be accepted provided its bactericidal effects are demonstrable. Work solutions that have to be prepared and/or diluted from stock solutions at the participant's site should be checked for the effective concentration.
- There are three accepted methods for soil or growing substrate disinfection:
  - Soil steaming.
  - High temperature.
  - Chemical disinfection.

3 Materials and equipment

- All materials passing through a red or green lock must be assessed by the risk identification team.
- Any material classified as a risk, must be disinfected before entering the green and yellow area.
- Waste can be brought from green area to yellow and/or red area, without disinfection.
- When materials and equipment are visually unclean it needs to be rinsed before disinfection.

4 Facilities

4.1 Physical layout:

- The participant must produce a drawing of the physical layout of each site: defining the yellow (if applicable) and green areas, the Red and green locks and the entities.
- Red locks are mandatory to enter a GSPP site. Green locks are mandatory for going from yellow to green. Green locks can also be used to create different entities.

4.2 Red locks are required in a GSPP-production site:

- The yellow area is not obliged, but can assist GSPP Participants in implementing practically the required parts for the Standard. Green and red locks are mandatory for an applicable yellow area.
- It must be impossible for unauthorized people to access yellow or green areas unless accompanied by an authorized person.
- A Red Lock is always physical. A Red Lock is designed to provide access to the 'four threats' (propagation material, water, people and materials (including equipment)) to the Yellow or Green Areas after sufficient disinfection and/or a risk analysis indicating that the risk of contamination with *Cmm* has been minimized. The risk of contamination between Red and Green or Yellow Area is minimized by a Red Lock. When entering the Yellow or Green area via the Red Lock, the boundaries (the start and end) of the Red Lock should be logic, identifiable/visible and controllable.

- A Red lock is always physical, but can be in place during a certain period of time only, a temporary Red lock:
  - This period should be clearly defined in the internal procedure of the company and it has to be registered with the GSPP secretariat.
  - All necessary measures have to be taken to assure that the requirements for re-establishment of a Red lock and the green area located behind it are met.
  - The taken measurements and risk analysis need to be registered and audited in the period of GSPP plant production after re-establishment of the Red lock.
  - The (re-)establishment of red lock can be defined as follows:
    - The first time a red area becomes green (so the first time there is establishment of a red lock) the participant has to carry out a risk analysis and make sure to be audited by the AO during the production period of the extended part. It is acquisition of red area to green.
    - When a participant decreases the green area (by moving a red lock), this is possible and the new red lock should be addressed by a risk assessment and an internal audit. External audit is not necessary here, as it was already green.
    - When the participant wants to increase the green area again to the previous size. This can again be addressed by the risk assessment and an internal audit. During the regular external audits, risks assessments need to be checked for their accuracy.
    - When the participant increases the green area, and yellow area becomes green area, the participant has to carry out a risk analysis.
    - There is no minimal or maximum number of changes, however, a time limit (2 years) is set between the first movement of the red lock and an external audit takes place.
  - A layout of the site must be drawn up with the situation when the Participant is using a temporary Red lock.

4.3 When passing through the red lock:

- Change into clean clothes and shoes or cover them entirely.
  Clean clothes must be:
  - Washed with detergent (no specific temperature or detergent requirements) or dry cleaning if steam is part of the dry cleaning process.
  - Stored under hygienic conditions and worn in the referred green and yellow areas only.
  - Must cover all personal clothes worn. In case circumstances ask for another way of clothing and not all personal clothes or bare body parts are covered totally this should be included in the Risk Analysis of the Participant and appropriate measures been taken, in such a way that they cannot come in contact with plants or are disinfected.
  - The participant is free to choose gloves or a good hand disinfectant (or both).
  - Footwear must be adequately cleaned and disinfected, stored under hygienic conditions and worn in the referred green and yellow areas.
- Wash and disinfect hands.
  - In case of using gloves, they need to be disinfected after putting them on.
- This must take place in a logical sequence (from dirty to clean).
- Personal belongings are not allowed beyond the red lock unless disinfected.
- The following personal belongings may pass the red/green lock without disinfection:
  - Glasses.
  - Wedding rings (when smooth).

- Ear rings/piercings (when smooth).
- Others: when in clean plastic bags or when disinfected.

- Electronic devices (laptops, PDA's, cameras, mobile phones): these have to be assessed in a risk assessment.

4.4 A green lock is required to separate entities. A Green lock is a 'physical or non-physical separation', this lock is compulsory between yellow and green areas. It can consist of:

- A door or metal bar to prevent undisturbed access and/or
- An additional disinfection station of hand, wheels or other parts or tools.
- A lock in time is also possible. It means that entities can be separated by time e.g. Between the first and second day there have been taken measures which foresee in disinfection of all materials used and people entering the facility in clean clothes again. In delicate processes (such as grafting) which carry higher risks of transmitting *Cmm* this is a way to define entities.

A green lock is implemented and required if a risk analysis shows a potential risk of contamination or cross-contamination. In these cases preventive measures must be written down and implemented, by doing so risks of contamination between entities are minimized.

Entities are described in several ways and are company specific. It can consist of, but not limited to:

- A group of plants separated from other groups of plants, identifiable through the track and trace system.
- A separation or sub-division of a group of plants related to the four threats. An entity can be sub-divided into other (sub)-entities.
- When sub-dividing an entity, a plant's entity must remain clear at all times (tracking and tracing) downstream and upstream in the process.

4.5 *Solanaceous* plants (or parts of it) are not allowed to grow in the yellow area.

4.6 The green area is always covered with glass, plastic or insect netting. Companies raising young plants for fruit production do not need insect netting in the greenhouse windows.

4.7 Netted greenhouses (for seed production and production of young plants for seed production): mesh size must not be more than 2*7 mm.

4.8 All activities vulnerable to *Cmm* contamination must be carried out under green conditions throughout the entire production cycle.

4.9 Seed production: the risk is very slight once the fruit has been harvested. Further activities can therefore take place outside the green area provided they undergo risk analysis.

4.10 The premises must be kept neat and tidy.

4.11 Everyone is entitled to leave the green area briefly for certain permitted activities. These permitted exceptions to the rule must be decided and justified by a risk analysis and only to go from the green area to the red area and back.

4.12 The Participant must define and maintain a procedure for **regular** renewing netting/plastic/glass (or any other product) covering a greenhouse/tunnel, separate from incident management in case of red lock breach. It must be done when there is no Solanaceous crop in the compartment(s). The green area must be protected against the four threats by a green or red lock during renewing netting/plastic/glass. A risk analysis must be made and appropriate measures have to be taken before the compartment(s) turns into green area again and the temporary green or red lock can be removed.

5 Starting material for seed production

5.1 Seeds as starting material for seed production of the below mentioned species need to be checked being free of *Cmm* with lab tests giving negative results:

- *Solanum cheesmaniae* (L.Riley) Fosberg (= *Lycopersicon peruvianum* var. *parviflorum* Hook.f.)
- *Solanum galapagense* S.C.Darwin & Peralta (= *Lycopersicon cheesmaniae* f. *minor* (Hook.f.) C.H.Mull., *L. cheesmaniae* var. *minor* (Hook.f.) D.M.Porter, *L. esculentum* var. *minor* Hook.f.)
- *Solanum lycopersicum* L. – Tomato, Cherry tomato etc. (= *Lycopersicon cerasiforme, L. lycopersicum* and many others)
- *Solanum pimpinellifolium* L. – Currant Tomato (= *Lycopersicon esculentum* ssp. *intermedium* Luckwill, *L. esculentum* ssp. *pimpinellifolium* (L.) Brezhnev in Zhukovskii, *L. esculentum* var. *racemigerum* (Lange) Brezhnev in Zhukovskii, *L. pissisi* Phil., *L. racemiforme* Lange, *L. racemigerum* Lange)
- *Solanum pennellii* Correll (Neolycopersicon group)
- *Solanum habrochaites* S. Knapp & D.M. Spooner (= *Lycopersicon hirsutum* Dunal)
- Interspecific crosses with one of the species mentioned above.

5.2 Each generation of basic seed needs to be tested.

5.3 Seeds of species listed in 5.1 have to be tested and must originate from GSPP participants and must comply with the GSPP requirements. Seeds of species other than listed in 5.1 can pass the red and green locks without testing. The requirements mentioned in 5.11 are applicable.

5.4 Seeds of species listed in 5.1 must have been sampled and tested according to the accepted protocol (see Annexes 14.1 and 14.3) by recognized laboratories and proof of the analysis must be available. The test results must be available before Scope 4 (applicable to all plants within the entity). All plant lots in the entity have to be removed when one seed lot proves to be infected. A risk analysis must be carried out to investigate and determine the risks of spread of *Cmm*. A reference seed sample must be available for confirmation of the original test result in case of an outbreak. This reference sample must meet the requirements described in Annex 14.1.

5.5 The use of cuttings of species mentioned in 5.1 and taken from plants in the green area is allowed in two situations:

- In case of low availability of seeds. Cuttings can be taken shortly after sowing without testing the plants to multiply the number of plants for the same production cycle.

- Use of cuttings or side shoots, to prolong or restart the production cycle without sowing. This procedure cannot be repeated for more than one production year or to start more than one new production cycle. This way of working will result in one entity of maximally 2 years and/or 2 production cycles after sowing.

5.6 Plants or plant parts (cuttings) of the species mentioned in the list in 5.1 and in the additional list below may not pass the red lock unless they are produced under GSPP conditions and at an accredited site:
- *Capsicum annuum* L.
- *Solanum nigrum* L.
- *Solanum melongena* L.
- Interspecific crosses with one of the species in the above list.

5.7 Mother material of cuttings of species listed in 5.6, must be produced in green areas and conditions.

5.8 Plants or plant parts (e.g. cuttings and *in vitro* propagated materials) of species other than listed in 5.1 and 5.6 may pass the red and green locks without testing, but for Solanaceous crops a risk assessment is obliged and requirements mentioned in 5.10 and 5.11 are applicable.

5.9 *In vitro* propagated material of the species mentioned in 5.1 and 5.6 may pass through a red and green lock when meeting all below mentioned criteria:
- The material has been grown *in vitro* on a tissue-culture medium for at least two weeks.
- No antibiotics have been added to the culture medium that can suppress growth of *Clavibacter michiganensis* subsp. *michiganensis.*
- No visual bacterial growth has been observed on the culture medium or on the *in vitro* propagated plant material.
- The *in vitro* propagated material (the part that has been cut) has been placed on or in the culture medium.

5.10 Additional requirements for cuttings from Solanaceous crops other than listed in 5.1 and 5.6 are:
- The material is 'Naktuinbouw Elite Ornamental Crops' or 'PPIS-Special quality label' certified and originates from 'Naktuinbouw Elite Ornamental Crops' or 'PPIS-Special quality label' accredited producers.
- Non-GSPP plants of the species listed in 5.1 and 5.6 were absent at or in the production location of the producer of cuttings at the time of producing the cuttings to enter the GSPP-entity. The producer of the cuttings of Elite cuttings should provide a declaration that these species listed in 5.1 and 5.6 were not present in the entity.
- The cuttings can be tracked and traced and track and trace is auditable on site of production.

5.11 Additional requirements regarding general management are (with the exemptions made for species listed in 5.1 and *Capsicum annuum*, species that can be crossed with *Capsicum* (e.g. *Capsicum chinese*), *Solanum melongena* and species that can be crossed with *Solanum melongena* (*Solanum aculeatissimum*), *Solanum torvum* and *Petunia* X *hybrida*.):
- GSPP Tomato or tomato rootstocks (and above mentioned exemptions) are handled first followed by other Solanaceous crops.

- Working in other Solanaceous crops followed by work in GSPP tomato/tomato rootstocks (and above mentioned exemptions) is only possible after changing into clean clothes and disinfection of footwear, hands and materials.
- There is always a green lock between GSPP tomato/tomato rootstocks (and above mentioned exemptions) and other Solanaceous crops.
- A risk analysis must be made and based on the results appropriate measures need to be taken before re-use or entry of any kind of materials.

5.12 *Solanaceous*-pollen must originate from GSPP productions.
Exemptions: Pollen of *Capsicum annuum,* species that can be crossed with *Capsicum* (e.g. *Capsicum chinense*), *Solanum melongena* and species that can be crossed with *Solanum melongena* (*Solanum aculeatissimum*), *Solanum torvum* and *Petunia X hybrida*, can pass through the red/green lock(s) without being tested and does not have to originate from GSPP productions.

5.13 If *Cmm* has been found in any plant in an entity, neither plants nor seeds from this entity can be released as GSPP.

5.14 Seed companies must inform seed producers and subcontractors (e.g. by individual notification on packaging, packing list or joined documents or general statement) that all starting material (e.g. seeds of parental lines, pollen, vegetative material, parts of plants, etc.) complies with the GSPP requirements.

6 Plant production for seed production

6.1 The ventilation opening must be covered by netting with mesh size not bigger than 2*7 mm.

6.2 The participant may sow the seeds, even if no test results are yet available. The test results must be available before Scope 4 (applicable to all plants within the entity) and proof of the analysis must be available. All plant lots in the entity have to be removed when one seed lot proves to be infected. A risk analysis must be carried out to investigate and determine the risks of spread of *Cmm*.

6.3 Biological crop protection is not regarded as a risk.

6.4 Dust is not regarded as a risk.

6.5 The GSPP standard requires that plants used for seed production must be raised at a GSPP accredited location. Parent plants grown by a not yet accredited plant raiser can be used for seed production on the following conditions:
- Seed producers have to require from their plant raiser the proof that they are in progress towards GSPP-accreditation.
- The plant raiser is in progress towards GSPP-accreditation when an application is done and an audit is planned before the seed production is finished.
- This audit must lead to a positive recommendation to the GSPP Board and a positive decision about accreditation by the board before the seed production of the delivered parent plants is finished.
- The plant raiser in progress towards GSPP-accreditation must also declare to the GSPP seed producer that, in case of a confirmed infection of the parent plants, the plant raiser will allow a GSPP specialist to carry out a root cause analysis and will follow the steps described in the TIP.

6.6 Furthermore conditions as described in paragraph 5 apply.

7 Seed Production

7.1 All plants (male and female) must be grown in a green area.

7.2 *Non-Solanaceous* plants or plant parts may pass through the red and green locks without testing, but a risk assessment is obliged.

7.3 Seeds from *non-Solanaceae* can pass the red/green locks without testing.

7.4 *Solanaceous* plants or plant parts may not pass through the red and green locks unless they are produced under GSPP conditions and, at an accredited site, or are *in vitro* propagated materials, see chapters 5.6, 5.7, 5.8 and 5.9 of this annex.

7.5 *Solanaceous* seeds and pollen must be produced in GSPP productions by a GSPP participant, as written in 5.12. Exemptions:

For *Capsicum annuum* and species that can be crossed with *Capsicum* (e.g. *Capsicum chinense*), *Solanum melongena* and species that can be crossed with *Solanum melongena* (*Solanum aculeatissimum*), *Solanum torvum* and *Petunia*.

- Pollen from these crops may pass through the red and green locks without being tested.
- Seeds from these crops are allowed to pass the red and green locks without testing.
- They do not have to come from GSPP participants or GSPP productions, as written in 5.12.

7.6 Seeds can be considered GSPP after one production cycle under accreditation.

7.7 Seed production is only possible under covered conditions (glass, netting, plastic, etc.). Mesh size must not be more than 2*7 mm.

7.8 Growing in soil is allowed under the following circumstances:

- When the soil/plot is used for the first time: the seeds from the last harvest must be tested prior to delivery of any seeds from this production to plant raisers and/or fruit production grower.
- If this new soil/plot is in an existing yellow area, there is no need to wait for the last harvest for testing the seeds prior to delivery
- Mulching of a GSPP crop is allowed. But when *Cmm* occurs, the previous crop has to be evaluated in the root cause analyses.

7.9 Biological crop protection is not regarded as a risk.

7.10 Dust is not regarded as a risk.

7.11 Seed producers may not display or use the GSPP logo (e.g. on packaging and/or documents), when seeds are shipped to a seed company.

7.12 Seed production by seed producers

The GSPP standard requires that the seed production must be done at a GSPP accredited location. GSPP seeds produced for **a not yet accredited seed company** must comply with the following conditions:

- The seed producer has to require, from the seed company in progress for GSPP accreditation, prove that they are in progress.
- An initial audit is conducted, during the first production cycle which follows the application, without major non conformities and with a positive decision about accreditation by the board, before the seeds suitable for GSPP get into the inventory of the seed company.
- The seed producer requests the seed company to confirm by writing or mail that the basic seeds they are sending for the seed production is tested free of *Cmm*.
- The seed company in progress must also declare to the GSPP seed producer that, in case of a confirmed infection, the seed company will allow a GSPP specialist to carry out a root cause analysis and will follow the steps described in the TIP.

GSPP seeds produced by **a not yet accredited seed producer** must comply with the following conditions:

- The seed company has to require from the seed producer in progress for GSPP accreditation, prove that they are in progress.
- An initial audit is conducted with the seed producer during the first production cycle which follows the application, without major non conformities and with a positive decision about accreditation by the board, before the seed suitable for GSPP get into the inventory of the seed company.
- The seed producer has to require the seed company to confirm by writing or mail that the basic seed they are sending for the seed production is tested free of *Cmm*.
- The seed producer in progress must also declare to the GSPP seed company that in case of a confirmed infection the seed producer will allow a GSPP specialist to carry out a root cause analysis and will follow the steps described in the TIP.

In both cases it is referred to chapter 12 Seed trading for applying the requirements of trading the seed suitable for GSPP.

8 Seed Extraction (scope 7)

8.1 Seed extraction can take place in the red area, as risk of seed contamination with *Cmm* is regarded low when:

8.1.1 GSPP tomatoes are separated from non-GSPP tomatoes for extraction:

8.1.1.1 Physically separated in such a way that batches cannot be mixed

8.1.1.2 Materials are thoroughly rinsed with water between batches.

8.1.2 In case of fermentation and or enzyme treatment: when the same solution is re-used (partially) for different seed lots, these seed lots become one entity.

8.1.3 When using a solution with disinfecting properties to extract seeds or as part of the seed extraction process, in a solution of recommended strength for disinfection and/or proven to be effective against *Cmm*, the disinfectant fluid itself is not regarded to be a vector of transmission.

8.1.3.1 Physically separated seed batches of any kind may be disinfected together in aforementioned solution, without becoming one entity.

9 Seed Processing (scope 9)

9.1 Dry seed processing can take place in the red area, as risk of seed contamination with *Cmm* is regarded low when:

9.1.1 GSPP tomato seeds are separated from non-GSPP tomato seeds for processing.

9.1.1.1. Physically separated in such a way that batches cannot be mixed.

9.1.1.2. Dust is not regarded as a risk.

10 Seed Treatment (scope 11)

10.1 Seed treatment can take place in the red area, as risk of seed contamination with *Cmm* is regarded low when:

10.1.1 Tomato seeds produced under GSPP conditions are separated from tomato seeds produced under non-GSPP conditions for treatment.

10.1.1.1 Physically separated in such a way that batches cannot be mixed.

10.1.2 Seed treatment: When using a seed disinfectant in a solution of recommended strength proven to be effective against *Cmm*, the disinfectant fluid itself is not regarded to be a vector of transmission.

10.1.2.1 Physically separated seed batches of any kind may be disinfected together in aforementioned solution without becoming one entity.

10.1.3 Seed treatment: When a solution without disinfecting properties is (partly) reused, the respectively treated batches become one entity.

11 Plant production for fruit production

11.1 Seeds or plants, of tomato and tomato rootstock, must be GSPP-certified.

11.2 Seeds may pass through a red and green lock as non-GSPP except species listed in 5.1.

11.3 *In vitro* propagated material may pass through a red and green lock when meeting all below mentioned criteria including the requirements as described in paragraph 11.5:

- The material has been grown *in vitro* on a tissue-culture medium for at least two weeks.
- No antibiotics have been added to the culture medium that can suppress growth of *Clavibacter michiganensis* subsp. *michiganensis.*
- No visual bacterial growth has been observed on the culture medium or on the *in vitro* propagated plant material.
- The *in vitro* propagated material (the part that has been cut) has been put in or on the culture medium.

11.4 Cuttings and plants may pass through a red and green lock as non-GSPP except the species listed in 5.1 and 5.6 which are required to be raised in a GSPP accredited entity.

11.5 Additional requirements for cuttings from Solanaceous crops other than listed in 5.1 and 5.6 are:

- The material is 'Naktuinbouw Elite Ornamental Crops' or 'PPIS-Special quality label' certified and originates from 'Naktuinbouw Elite Ornamental Crops' or 'PPIS-Special quality label' accredited producers.
- Non-GSPP plants of the species listed in 5.1 and 5.6 were absent at or in the production location of the producer of cuttings at the time of producing the cuttings to enter the GSPP-entity. The producer of the cuttings of Elite cuttings should provide a declaration that these species listed in 5.1 and 5.6 were not present in the entity.
- The cuttings can be tracked and traced and track and trace is auditable on site of production.

11.6 Additional requirements regarding general management are (with the exemptions made for species listed in 5.1 and *Capsicum annuum*, species that can be crossed with *Capsicum* (e.g. *Capsicum chinese*), *Solanum melongena* and species that can be crossed with *Solanum melongena* (*Solanum aculeatissimum*), *Solanum torvum* and *Petunia* X *hybrida*.):

- GSPP tomato or tomato rootstocks (and above mentioned exemptions) are handled first followed by other Solanaceous crops.
- Working in other Solanaceous crops followed by GSPP tomato/tomato rootstocks (and above mentioned exemptions) is only possible after changing into clean clothes and disinfection of footwear, hands and materials.
- There is always a green lock between GSPP tomato/tomato rootstocks (and above mentioned exemptions) and other Solanaceous crops.
- A risk analysis must be made and based on the results appropriate measures need to be taken before re-use or entry of any kind of materials.

11.7 If *Cmm* has been found in an entity of plants, no plants from this entity can be released as GSPP.

11.8 Biological crop protection is not regarded as a risk.

12 Seed trading

12.1 Seed have to be produced under GSPP conditions.

12.2 It must be proven that seeds have been tested and sampled according the accepted protocol (see website annex 14.1 and 14.3) by recognized laboratories (§13 below). A reference seed sample must be available for confirmation of the original test result in case of an outbreak. This reference sample must meet the requirements described in Annex 14.1.

12.3 Seed companies and subcontractors must inform seed producers if the seed test on the produced seed lots proves positive.

12.4 If an entity or seed lot is found to be infected by *Cmm*, under no circumstances can seeds from this entity be released as GSPP seeds.

13 Laboratory analysis of seeds

The requirements from GSPP for laboratories for the testing of seeds are described in Annex 14.8 (see website).

13.1 Seeds may only be tested by recognized laboratories.

13.2 The laboratories must undergo proficiency testing at least once every three years.

13.3 Inheritance rules of tests results of seed batches are as follow (figure 3 and figure 4):

- Inheritance is only vertical downstream
- Horizontal inheritance is not possible

Figure 3. Inheritance of seed test results after processing.

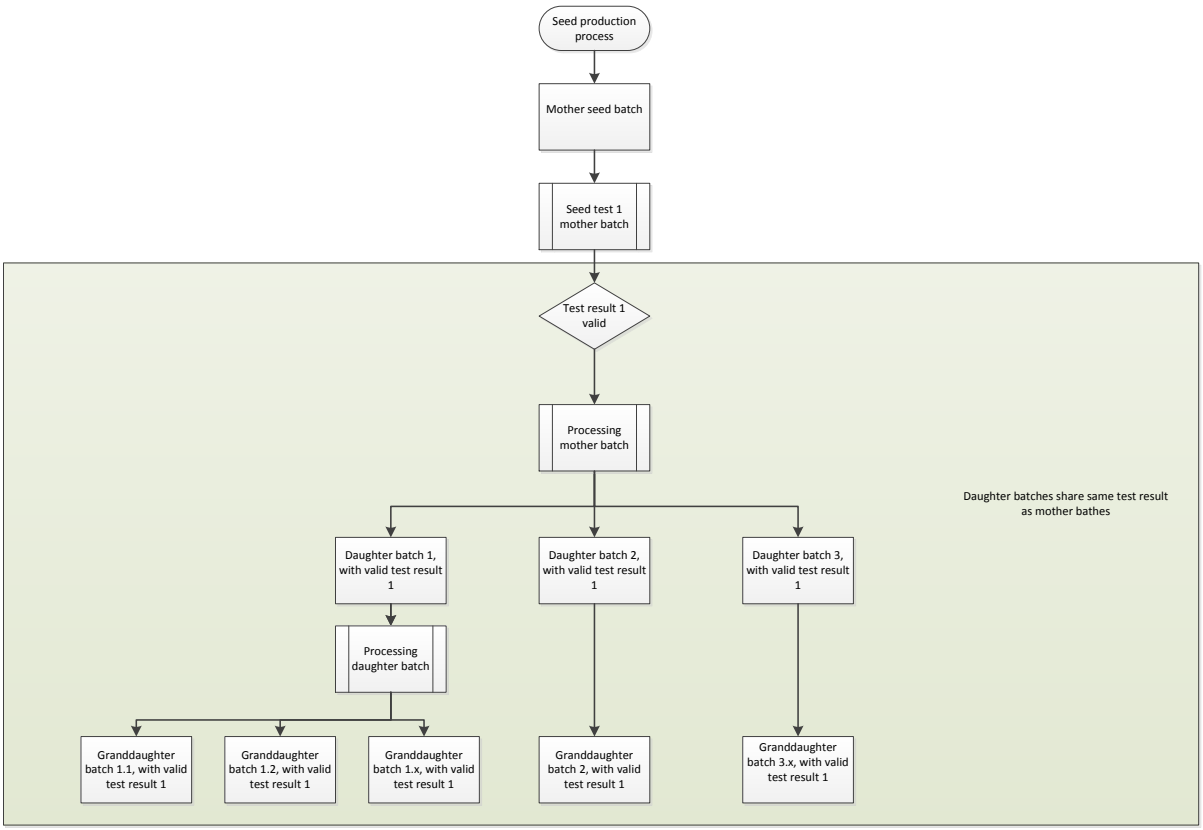
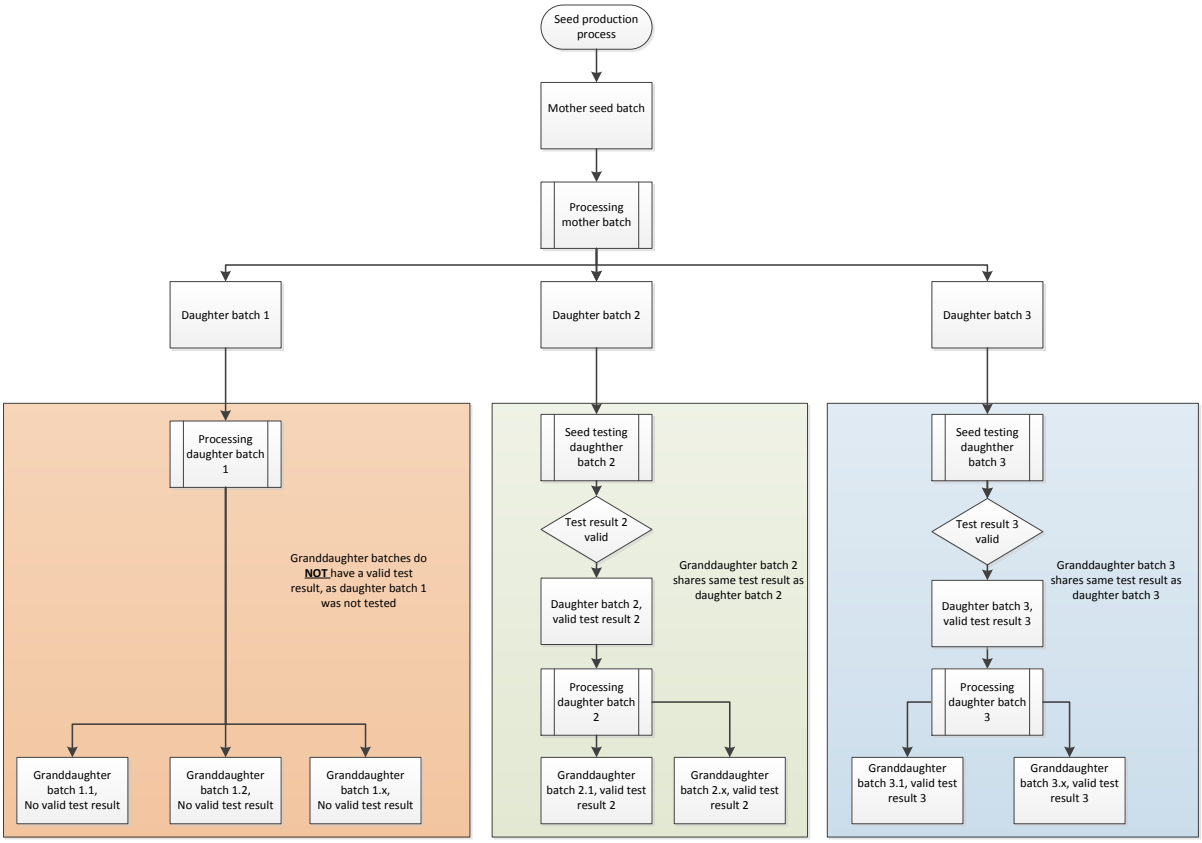


Figure 4. Inheritance of seed test results generated after processing mother batch to daughter batches and granddaughter batches.



14 Laboratory analysis of Plant testing

The requirements from GSPP for laboratories for the testing of suspected plants are described in Annex 14.8 (see website). Laboratories must use the GSPP protocol (annex 14.2, see website).

14.1 Where the participant sub-contracts the testing, the laboratory must undertake in writing to follow a GSPP-recognized protocol for detecting *Cmm*.

14.2 Field detection kits (immunokits for *Cmm* or *Cmm* specific PCR) can be used as a preliminary tool to identify possible contamination in the field, if doubtful symptoms are seen on a plant by a pathologist:

- If the field detection kit is negative, there is no *Cmm*, however, the expert/pathologist may decide to perform a lab test also to confirm the test result.
- If the field detection kit is positive, a laboratory test is compulsory to define if the plant is really contaminated. The final results should be a combination of test results in the laboratory, field inspections (presence of symptoms) and expertise of the plant pathologist assigned to assist production.

14.3 Companies cannot rely on the outcome of a field detection kit alone in case of a positive test result.

15 Documents and Labelling

The requirements for delivery documents and labelling are described in chapter 10 of the GSPP Standard.