

GSPP

Good Seed and Plant Practices

New international business chain system for hygiene in tomato seed production and plant raising to prevent infection with pathogens

June 2011

What is GSPP?



GSPP stands for Good Seed and Plant Practices

*GSPP is a hygiene and prevention system focusing on *Clavibacter michiganensis* spp. *michiganensis* (Cmm) in tomato and rootstock for protected crops, strictly following state of the art standards and protocols with independent audits.*

The goal of GSPP is to improve along the propagation chain the management and the prevention of Cmm risk. Zero risk with Cmm doesn't exist.

The success of GSPP depends on the involvement of all partners in the chain, from seed producer until young plant raisers.

The Good Seed and Plant Practices Initiative & background



- March 2007: 1st meetings seed suppliers and plant raisers in the Netherlands
- May 2007: International Steering Group *Cmm* (NL and FR)
- Oct. 2007: 1st version of Hygiene protocol
- Spring 2008: Pre-audits by Naktuinbouw and SOC:
16 seed production sites & 11 plant raisers
- 2009: Implementation improvements / 2nd version of Hygiene protocol /
Start of GSPP Foundation
- 2010: Accreditation audits
- July 2011: Launch of GSPP seeds + plants (glasshouse heated markets)
- Beyond July 2011: extension to other protected tomato segments (unheated)

Scope of GSPP initiative

Breeding

not in the scope of GSPP



Seed production



Extraction etc.



Selling



Plant raising – *sowing*



Plant raising – *plant stage*



Growing

not (yet) in the scope of GSPP



GSPP

Added Value of GSPP



- **Effective *Cmm* risk management and prevention**
 - State of the art **seed hygiene standards**
 - Statutory continuous **improvement** process of the whole system
- **Independent & Transparent system**
 - **Independent** industry standard hygiene protocols and accreditation audits – same for all companies involved
 - **Transparency** about protocol and measures to be taken
 - System is **open** for everybody

Added Value of GSPP

- **Industry responsibility**
 - **Joint responsibility** of seed companies, plant raisers and growers for managing and preventing the risk on *Cmm*
 - In case of an outbreak of *Cmm*, the **Technical Investigation Procedure (TIP)** will be put into operation: independent expert, independent testing, finding the root cause of the problem and improving the system
 - **Chain approach** – the whole propagation chain is involved

Why do we need GSPP?

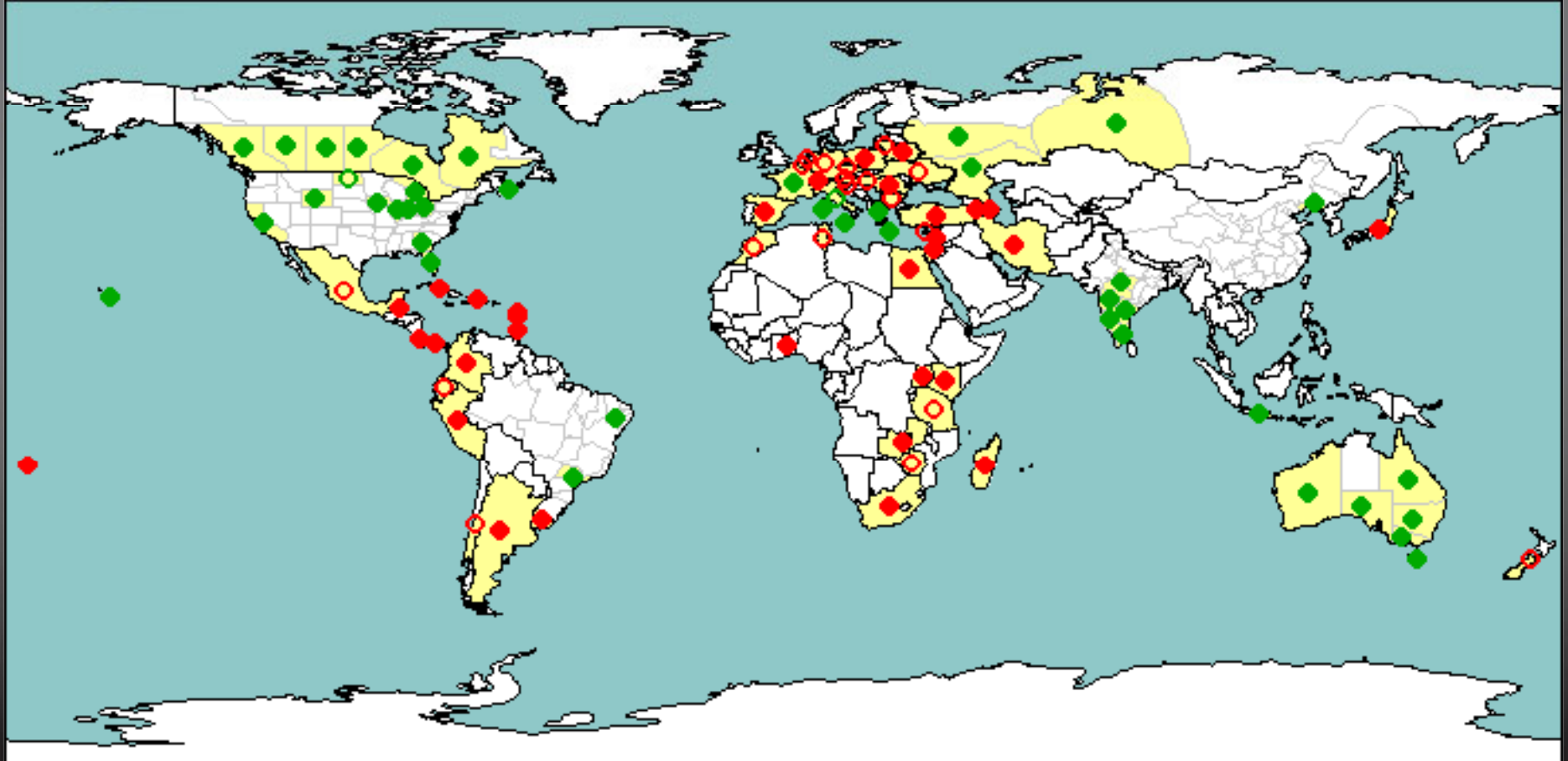
In the last 5 years we have seen an increased number of *Cmm* outbreaks globally, both in Europe (Netherlands, Spain, Italy, France etc.) and outside Europe (Mexico, Canada, etc.).

The consequences of an outbreak are serious:

- Stop movements of young plants
- Retesting of seed batches
- Removal of contaminated batches (plants and seeds) from the trade
- Removal of diseased plants and surrounding plants by growers
- Highly costly claims and court cases
- Lose of trust between seed suppliers, plant raisers and growers



Clavibacter michiganensis



National record



Present



Present only in some areas

Subnational record



Present



Present only in some areas

2006-09-19

Consequences of outbreaks

- Stop movements of young plants
- Retesting of seed batches
- Removal of contaminated batches (plants and seeds) from the trade
- Removal of diseased plants and surrounding plants by growers
- Financial claims and court cases
- Lose of trust between seed suppliers, plant raisers and growers

How do we improve as an industry ?

→ risk management and prevention along the chain

Why do we focus on protected tomatoes & tomato rootstock?

- The most important vegetable crop globally
- Year round production with intensive growing cycle
- Grafting and topping are very common -> highest risk
- Scale of production, trade and distribution has increased tremendously -> high risk

Cmm: what is the transmission and spreading impact

Crop handling, esp. when creating wounds	yes
Cropping: plant rests, soil, water	yes
Seed	yes
Young plant production, grafting and topping	yes
Fruits	limited
Other host plants (weeds, pepper, etc.)	limited

At all stages: depending on situation and control measures

Conclusion:

All partners in the production chain (seed producers, plant raisers, growers) play a role in prevention and risk management of *Cmm* spreading

What are the GSPP requirements for the various target groups?



General requirements:

- Clear organizational structure and supporting quality management system
- Defined procedures, protocols and working methods
- Quality manager
- Personnel qualifications and training
- Systematic risk analysis in order to identify risks and associated control measures
- Internal audits, corrective action procedures and management review

These general requirements are derived from ISO and HACCP systems.

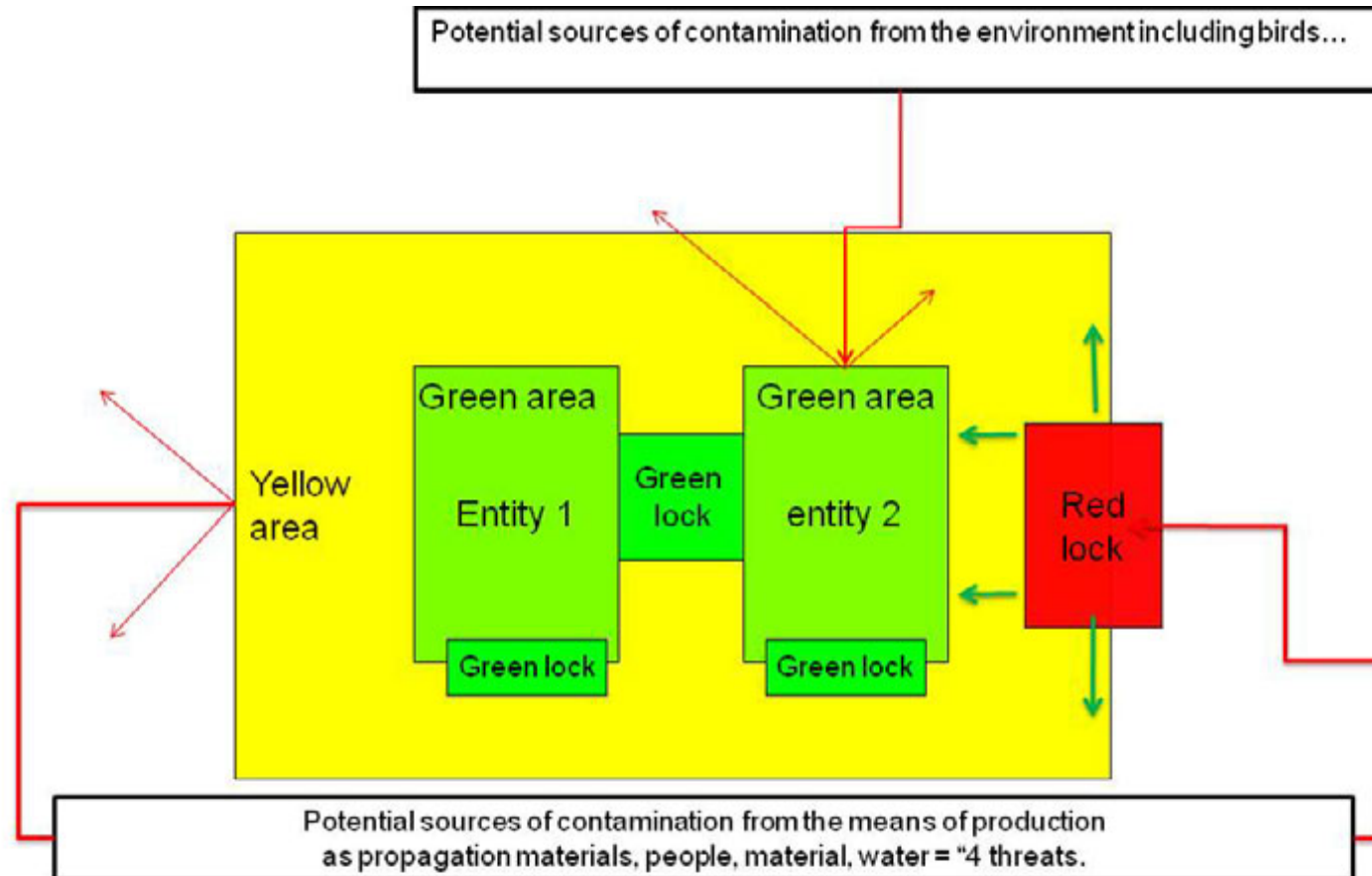
What are the GSPP requirements?

4 main threats: water, people, propagation material and equipment

GSPP production site requirements:

- Isolation of site and definition of areas separated by locks
- **Red area:** (outside GSPP production site): *Cmm* might be present
- **Red lock:** physical barrier allowing the entry of the 4 threats into the yellow area, or directly into the green area if no yellow area, after a strict hygiene protocol
- **Yellow area:** (not compulsory) physical separation from red to green areas.
- **Green lock:** physical or not physical barrier with preventive measures linked to the 4 threats according to the risk analysis.
- **Green area:** only area where plants can grow. Always covered (glass, plastic, netting). Very strict hygiene checks. Limited and controlled access.

GSPP Protocol: Different areas



Red lock = always a physical separation
Green lock = risk analysis of activities in relation to the four threats

Yellow area = controlled area
Black lines = fence to prevent unauthorized access.

Specific requirements linked to the 4 main threats

- **Water**
 - Guaranteed freedom of *Cmm* based on risk analysis
 - Or disinfected with efficiency evidence
- **People**
 - Protective clothes
 - High risk areas: change rooms for designated clothes and shoes, disinfection of hands
 - Training and education -> awareness and discipline
- **Propagation material**
 - All (parent) seeds need to be compliant to enter green area
 - Non compliant propagation material has to be kept separate
- **Materials**
 - Risk analysis per material to define whether disinfection is required before entering into green areas

GSPP: Process control

- Regular systematic inspections
- Sampling and testing of suspected plants according to defined protocol
- Emergency plan in case of suspected or confirmed infection
- All seeds are sampled according to set procedures; a specific procedure for sampling of small lots was developed
- Seeds are tested (30.000 seeds) using the latest version of validated protocol (ISHI version 3 + spiking/NAL 9.1)
- Seed tests to be done by recognized labs (e.g. NAL, SNES)
- Assured traceability of seed and plant lots
- Controlled handling, distribution and transport of seeds and plants

GSPP: Customer communication

- **Documents and labels**

- Clear and unambiguous
- Correct use of GSPP logo → seeds: packages
→ plants: documents

- **Technical Investigation Procedure (TIP)**

- Independent expert for technical root-cause analysis
- Cooperation with Plant Protection authorities
- Recall of seeds/plants if necessary, facilitated by traceability systems both for seeds and plants
- Re-entry procedures and audit following confirmed outbreak

GSPP: Planning & next steps



- **2010**
 - Initial audits
 - Seed companies to create GSPP stocks
 - Initial focus on heated glasshouse markets
- **July 2011**
 - GSPP seeds available from accredited sites
 - GSPP plants will follow afterwards
 - GSPP logo can be used (*Collective trademark*)

The GSPP Initiative is focused on Protected Tomato & Rootstock, *Cmm risk*

GSPP initiative is an industry learning curve



- Exchange of technical information by company specialists
- Best practices sharing
- Constructive industry dialogue across the chain
- Improved ownership, responsibility and commitment of the industry
- The system will also bring benefits to other crops because of the high level of hygienic measures which are applied

Conclusions

- Solid approach to manage *Cmm* disease risk and prevention in the tomato protected culture chain
- Only possible with open cooperation, collaboration and dedication of all partners in the chain
- Foundation Logo to become “the symbol” for Industry & Chain commitment

The GSPP organization

- Protocol and Logo owned by GSPP Foundation
 - Set up and financed by Dutch and French Associations of seed industry and plant raisers
 - Governed by a Board (4) with independent Chair
- Independent Auditing by Naktuinbouw and SOC
 - Will report non-conformities
 - Will recommend accreditation to Foundation
 - Annual follow-up audits. Renewal audit after 3 years
- Expert Group annually reviews audit results, complaints, technical developments, etc. and may propose protocol adaptations to the Board

Contact & Resources



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Back up slides

Background information on Cmm
GSPP accreditation
Pictures



Why focus on *Clavibacter michiganensis* subsp. *michiganensis* (Cmm)

- Bacterial disease in tomato
- Can easily be spread while symptomless
- Quarantine status in EU + many other countries
- Serious economic damages
- **No treatment possible ; only prevention and risk management are effective strategies**
- Wide global distribution
- Serious outbreaks during the last 10 years
- Growers require high level of hygiene and risk management



Internal (systemic) and external (superficial) infection and symptoms

- *Clavibacter* is a “systemic vascular wilt pathogen”
- External symptoms resulting from systemic infection
 - Leaf necrosis, wilting, withering of folioles
 - Leaf wilting, mostly NWE, less elsewhere.
 - Plant death
 - Open stem cankers
- Internal symptoms resulting from systemic infection
 - Internal stem discoloration, vascular discoloration
 - External symptoms resulting from external infection”:
 - Small stem and leaf cankers
 - Bird’s eye lesions on fruit
 - Marginal leaf necrosis

GSPP: How to become accredited

- Company fills the application form, sends it to the GSPP secretariat, and pays a deposit
- The GSPP secretariat informs the audit organizations (AO)
- Naktuinbouw/SOC performs audit
- The AO sends audit report to the applicant
 - Non conformities may require repair and re-audit
 - Appeal possibility if applicant disagrees
- The AO gives their recommendation to the Board
- The Board decides and informs the applicant
- Accreditation is published on Foundation website
- Site can use the logo

- See www.gspp.eu

GSPP: cost of accreditation

- Annual fee to Foundation for 2011
 - Dependent on size of company
 - Between € 750,-- and € 10.000,-- per year

Class	Nr. of employees	Tariff (€)
S	1-25	750
M	26-100	2.500
L	101-500	5.000
XL	>500	10.000

- Audit fees
 - Approx. € 950,-- per auditor per audit day
 - Approx. € 475,-- per auditor per travel day
 - Cost of travelling and accommodation of auditor

Abbreviations

AO	Audit Organization
<i>Cmm</i>	<i>Clavibacter michiganensis spp michiganensis</i>
GSPP	Good Seed and Plant Practices
HACCP	Hazard Analysis Critical Control Point
ISHI	International Seed Health Initiative
ISO	International Organization for Standardization
NAL	Naktuinbouw Accredited Laboratories
SNES	Station Nationale d'Essai des Semences
TIP	Technical Investigation Procedure