The need for biological control in Egypt

January 16th, 2018, seminar biological control

Anne Elings, Wageningen UR Greenhouse Horticulture

Problem & solution

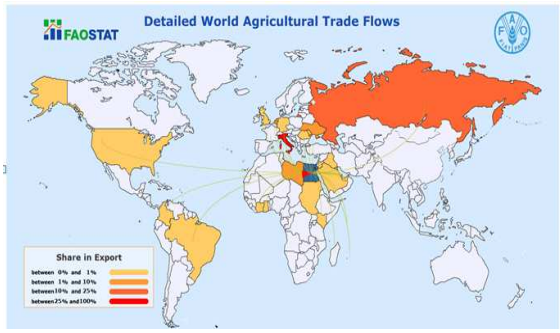
- Problem: too much chemical residues
- Solution: less and different spraying of chemicals

Horticulture in Egypt

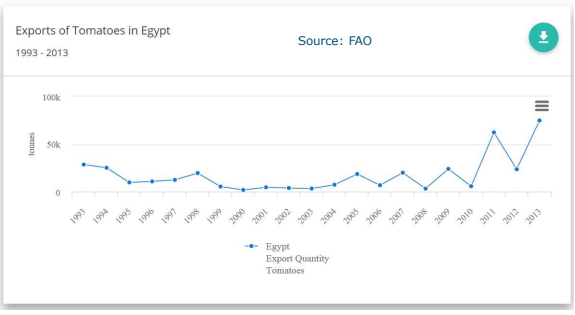
- A wide variety of products
- From open field and protected
- For local market and export

Source: HEIA

Egyptian exports of fresh vegetables



Export of tomatoes



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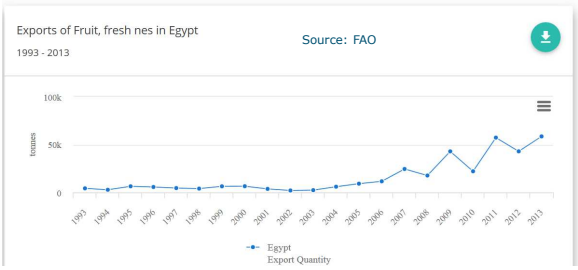
Export of fruits



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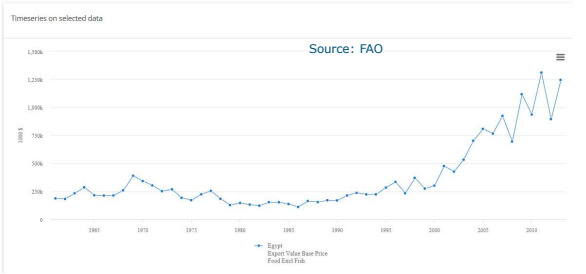
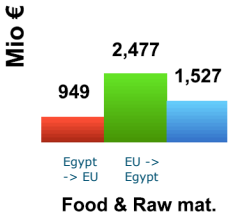
Export value



EU merchandise trade with Egypt in 2016

The EU is both Egypt's biggest import and export partner, covering 31.3% of Egypt's trade volume in 2016.

Source: EU



The problem

Saudi Arabia bans imports of Egyptian strawberries

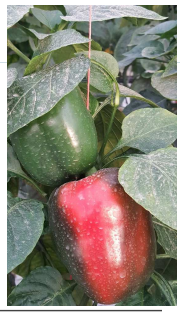
EGYPT

Iraq bans Egyptian vegetable and fruit exports

Sudan bans Egyptian fruit, vegetables and fish

FOOD POISONING NEWS

IMPORTED EGYPTIAN FRUITS BANNED WORLDWIDE IN WAKE OF TROPICAL SMOOTHIE OUTBREAK



EGYPT

Agriculture Minister introduces new system for exporting Egyptian strawberries

An urgent need for change

- Economic
  - Loss of product value
  - Stricter demands by local and export markets
- Ecologic
  - Pollution of surface water, lands, etc.
- Human health
  - Workers
  - Consumers
- Farm management
  - Development of resistance by the crop
  - Phytotoxic effects of chemicals
- Consequences
  - Lower permitted residue levels
  - Fewer PPP's registered for horticulture

Health

Acute problems:

- Dizziness
- Diarrhoea
- Skin irritation
- Stomach-ache
- Headache
- Burning eyes
- Double sight
- Confused
- Unconscious

Chronic problems:

- Tiredness
- Bad sleeping
- Breathing problems
- Liver damage
- Kidney damage
- Nerve system damage

Solution: Integrated Pest Management

- Good production systems
- Sanitation
- Crop resilience
- Climate control
- Substrate cultivation
- Knowledge exchange
- Staff management
- Biological agents.

What is Integrated Pest Management?

- Originally: control of pests (or diseases) with a combination of chemical and biological control agents
- Currently
  - all measures to control pests and diseases
  - which will lead to a minimum use of chemical pesticides
  - and lower the residue levels on the fruits
  - Through prevention, hygiene, scouting monitoring, resistant crops, natural enemies, biological pesticides, selective chemical pesticides, etc.

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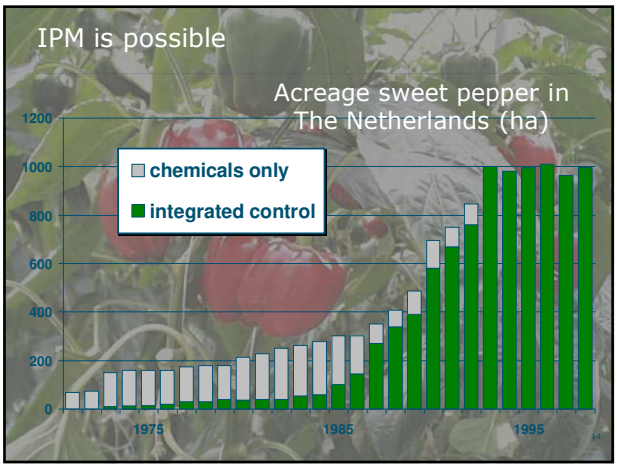
IPM is possible



Good production systems

- Availability of inputs
- Well-trained staff
- Protocols
- Documentation
- logistics
- more

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Greenhouse climate

Humidity control to prevent condensation.

Against:

- *Botrytis*
- Powdery mildew
- *Cladosporium*

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Sanitation

- Prevention
- Scouting
- Cleaning

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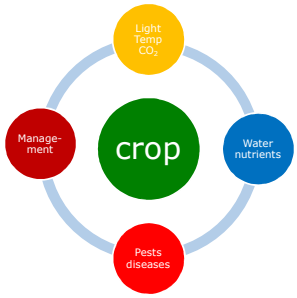
Everything is integrated



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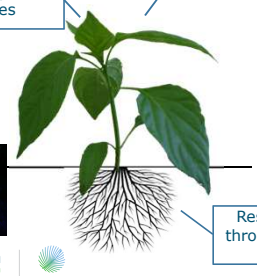
Resilience against pathogens and pests

courtesy Dr. G. Messelink

A "standing army" of natural enemies

Resilient plants breeding, induced resistance (e.g. with light)



Resilient soil/substrate through biotic and abiotic factors

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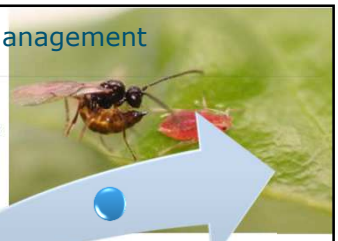
Pest and disease Management



Optimal pest and disease management increases production level and product quality with less use of chemicals

Chemical crop protection

100% integrated pest management

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Biological control

- Predatory mites
- Parasitic wasps
- Predatory bugs
- Gall-midges
- Biological agents (Bt's, virus, bacteria, nematodes)
- Soil predators
- Banker plants
- Alternative and additional food

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Enabling environment – risk assessment

RISK	RESPONSIBLE ENTITY	RISK MANAGEMENT
PRODUCT		
Incorrect pest identification	Research	Correct identification
Incorrect organisms in BCA	Supplier	Random identification by Plant Protection Service in country of origin
	Supplier	predators are on the BCA-list of the EPPO region, and the USA Exclusion list
Low activity of BCA	Supplier	batch-wise control by producer according IOBC guidelines (for Europe)
	Supplier, grower	advanced transport & storage system

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Enabling environment – risk assessment

RISK	RESPONSIBLE ENTITY	RISK MANAGEMENT
ENVIRONMENT		
Exotic biodiversity	Ministry	BCA-list (EPPO) and Permit for Interstate Shipment (USA) are based upon broad expert knowledge, resulting in safe import in 60 countries.
FARM		
yield and quality reduction	Grower	Proven technology: training, technical support, research, study groups
Crop attacked by BCA	supplier	In country of origin, a criterion to select BCA is its inability to attack plants.

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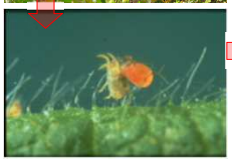
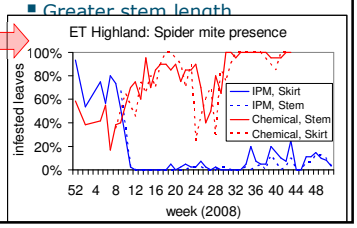
IPM in Ethiopia: starting with one single



- Rose: various varieties
- Red spider mite *(Tetranychus urticae)*
- *Phytoseiulus persimilis* & *Amblyseius californicus*
- 10-15% more stems m^{-2}
- Greater stem length



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IPM in Ethiopia: Up-scaling

- Acreage
  - More ha per farm
  - More farms, different environments
- Other crops, pests, bca's
  - Herbs - white fly & thrips - *Eretmocerus* & *A. swirskii*
  - Tomato - white fly - *Macrolophus caliginosus* & *Eretmocerus eremicus* & *Encarsia formosa**
  - Outdoor vegetables
- More suppliers

Lessons learned

- Commitment
- Identification & monitoring
- Intensive communication
- During transition phase:
  - Low pest levels
  - No chemical residues
- Knowledge exchange

How to realise IPM in horticulture

- Development of legislation and regulation for production, import and export of BCA's
- Demonstrations with BCA's from the positive list of EPPO
- *Collaboration* for IPM implementation and development
  - Institutional level
  - Technical level
  - Commercial level

In short, towards a solution to the problem

- Solutions are readily available
- Biological pest control is an essential element
- Egypt is lagging behind
- Priorities, resoluteness, collaboration, investments.

Thank you

anne.elings@wur.nl