Better Training for Safer Food
Initiative

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BTSF

This training is carried out by GIZ GmbH under the contract no 2013 96 11 with the Consumers, Health and Food Executive Agency (former Executive Agency for Health and Consumers).

Lecture 6

Consumers, Health And Food Executive Agency

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Environmental aspects and sustainable use of PPPs: IPM

Consumers, Health and Food Executive Agency (CHAFEA)

Consumers, Health And Food Executive Agency

OUTLINE

- **What is needed for designing IPM**
  - **Basics of integrated pest management (IPM)**
  - General principles on IPM -key elements in IPM
  - THRESHOLD VALUES
- **Biological pest control methods**
- **Examples of available low-chemical input alternatives;**
- **Case studies-guidelines for IPM**
- **Record keeping of professional use of PPPs**
- **Decision support schemes for IPM.**
- **Organic Farming**

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Basics of integrated pest management (IPM)

- **DEFINITION**
- **'integrated pest management' means careful consideration of all available plant protection methods and subsequent integration of appropriate measures that discourage the development of populations of harmful organisms and keep the use of plant protection products and other forms of intervention to levels that are economically and ecologically justified and reduce or minimise risks to human health and the environment. 'Integrated pest management' emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms;**

Basics of integrated pest management (IPM)

- **IPM is a dynamic process in which innovative solutions are integrated and locally adapted as they emerge and contribute to reducing reliance on pesticides in agricultural systems.**

Basics of integrated pest management (IPM)

- IPM is an ecosystem approach system
- information intensive approach to pest management based on
- Knowledge and
- Experience

- Pest Management Vs Pest Control

Why IPM?

- **Drivers for IPM**
- **Sustainable Use of Pesticides**
- **Resistance problems**
- **Availability of IPM tools (monitoring, non-chemical, threshold, etc)**
- **Environmental issues**

GENERAL PRINCIPLES ON IPM
KEY ELEMENTS IN IPM

- Pest identification
- Monitoring and assessing pest numbers and damage
- Guidelines for when management action is needed
- Preventing pest problems
- Using a combination of biological, cultural, physical/mechanical and chemical management tools

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GENERAL PRINCIPLES ON IPM
KEY ELEMENTS IN IPM

- **The EU Directive 2009/128/EC on the sustainable use of pesticides request the Member States to:**
- **Promote the use of IPM by professional users of pesticides**
- **Establish or support the establishment of necessary conditions for the implementation of IPM**
- **Encourage professional users to implement crop- or sector-specific guidelines for IPM on a voluntary basis**

General principles on IPM

- 'non-chemical methods' means alternative methods to chemical pesticides
- Such as
  - agronomic techniques
  - physical,
  - mechanical or
  - biological pest control methods

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AGRONOMIC TECHNIQUES
What are they and how can contribute to pest management

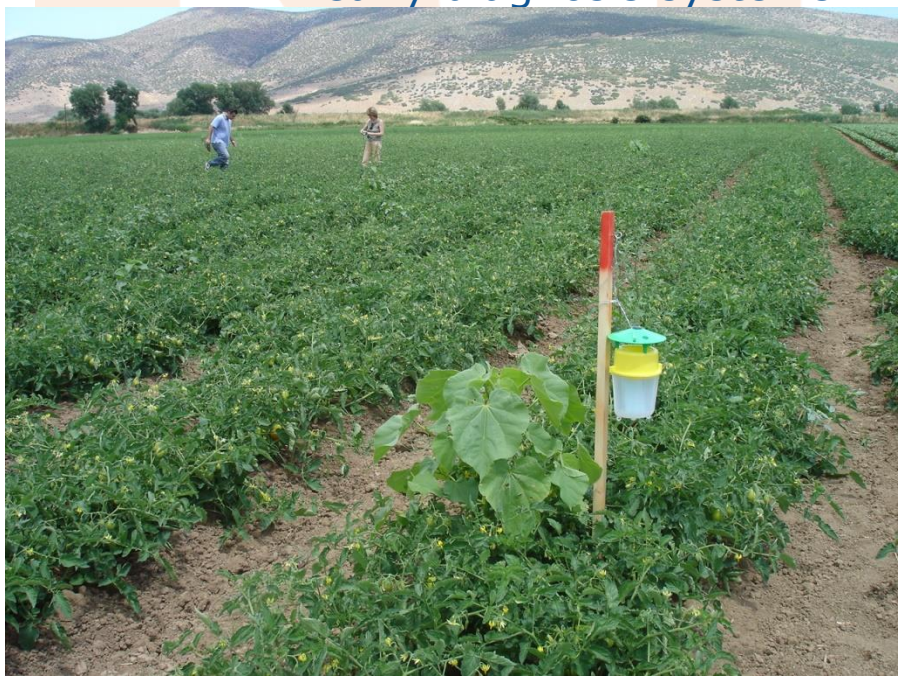
- crop rotation,
- use of adequate cultivation techniques (e.g. stale seedbed technique, sowing dates and densities, under-sowing, conservation tillage, pruning and direct sowing),
- use of resistant/tolerant cultivars and standard/certified seed and planting material,
- use of balanced fertilisation, liming and irrigation/drainage practices,

AGRONOMIC TECHNIQUES
What are they and how can contribute to pest management

- **Hygiene measures (e.g. by regular cleansing of machinery and equipment),**
- **Protection and enhancement of beneficial organisms**

MONITORING

- **Monitoring of Harmful organisms AND natural enemies**
  - Field observations,
  - scientifically sound warning,
  - forecasting and
  - early diagnosis systems



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Acoustic trap

THRESHOLD VALUES

Defined for the region, specific areas, crops and particular climatic conditions

- **Injury Levels and Action Thresholds for Each Pest Species in each crop**
- **Types of thresholds:**
- **visual threshold (pest population is already observable)**
- **damage boundary (damage can be observed);**
- **Economic or action threshold (end-user should apply a plant protection measure)**
- **economic injury level (a pest population is capable to cause a damage, which treatment costs are balanced with the benefit resulting thereof)**

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Sustainable biological, physical and other non-chemical methods must be preferred to chemical methods if they provide satisfactory pest control

Biological pest control methods.

Biological, physical and other non-chemical

- **Biological control**
  - **Conservation of the pests' natural enemies**
  - **Augmentation of existing natural enemies by releasing additional numbers of the same species.**
  - **Inoculation by the repeated reintroduction of effective natural enemies that are available commercially but are unlikely to live from season to season in the natural environment.**
  - **Importation of the host-specific natural enemies of exotic invaded pests (not available to private individuals)**
- **Pheromone and other attractants-based control (ethological control methods)**

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MONITORING

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Biological agents

Biological, physical and other non-chemical

- **Alternative methods might:**
- **be more time consuming;**
- **have lower and/or slower pest control power;**
- **be more expensive;**
- **have less negative impact on environment;**
- **be more sustainable;**
- **are more beneficial for whole society.**

Selection of pesticides: low-chemical input alternatives

- **The pesticides applied should be as specific as possible to ensure that they are the:**
  - least-disruptive to natural controls
  - least-hazardous to human health
  - least-toxic to non-target organisms
  - least-damaging to the general environment

Selection of pesticides: low-chemical input alternatives

- Specific pesticides are those toxic to a limited number of pests
  - One or few species: Codling moth granulosis virus
  - Higer taxonomic category: Bt for Lepidoptera larvae

- Selective pesticides are those non toxic to non-target organisms
  - Beneficial organisms
  - Human beings
  - General fauna and flora

Selection of pesticides: information on pesticide selectivity

IOBCwprs database

http://www.iobc.ch/toolbox.html

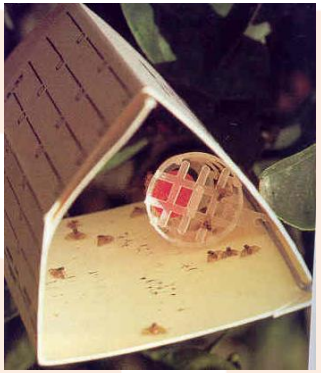
Selection of pesticides: low-chemical input alternatives (examples)

- **Pheromones and other attractants to lure and/or confuse the pest e.g. mating disruption for Lepidoptera insect pests**
- **Juvenile hormones that arrest pest development e.g insecticides with a.i that act as insect growth regulators**

Case studies for IPM

- **Guidelines for IPM management of Mediterranean fruit fly (Ceratitis capitata) in citrus**
- **IPM management for winter annual grass weeds**

Guidelines for *C. capitata*



- **Monitoring**
- **Trap types**
- **McPhail**
- **Lure types**
- **Liquid: Trimedlure**
- **Solid: trimetilamine, putrescine & ammonium acetate**

Guidelines for *C. capitata*

- **Management**
- **Mass trapping**
- **Sterile Insect Technique**
- **Cultural techniques**
  - sanitation
- **Chemical control**
  - Full cover sprays
  - Bait sprays
- **Attract and kill**
- **Biological control (experimental)**

IPM for winter annual grass weeds

- **A healthy crop rotation**
- **Delayed sowing**
- **Optimal plant density**
- **Focused soil cultivation, including**
  - Stale seedbed
  - Stubble cultivation
  - Ploughing
- **Optimized use of herbicides**

The professional user should keep the use of pesticides and other forms of intervention to levels that are necessary

- **use of the minimum amount of active ingredient per unit of surface necessary for an efficient use of the pesticide**
  - In other words: an IPM-farmer uses as little pesticide as possible, but as much as needed.
- **How to comply with this principle**

  Use of the minimum registered dose

  Reduced application frequency

  Partial sprayings of the surface

Resistance Management

- **Resistance of a pest to a pesticide is the capacity of a population of this pest species to survive to the exposition to doses of the pesticide which are lethal to the normal populations of the species**

- **Use of multiple pesticides with different modes of action**
- **Reduce insecticide selection pressure**
- **Avoid resistance mechanism selection**

Resistance Management

- **Consequences of pesticide resistance**
- **Increase of the dose and the number of sprayings of a pesticide applied by the growers**
- **Decrease of the commercial life of a pesticide**
- **Increase of the risks for human health and the environment**
- **Loss of the possibility of cultivating a crop in a entire area**

- **Antiresistance measures**
- **Use of multiple pesticides with different modes of action**
- **Reduce insecticide selection pressure**
- **Avoid resistance mechanism selection**

Decision support schemes for IPM

- **DSS are – almost exclusively – computer-based data processing mechanisms where the end user has to 'feed' the system with appropriate input data.**

- **DSS can either:**
- 1 focus on one or just a few crop/pest systems.
- 2 be complex web-based service covering many crop/pest systems.

Decision support schemes for IPM

- **How DSS help to reduce the pesticide input?**

- **Overview of available DSS**
- **Decision Support Systems against Potato Late Blight**


18
19
10
FruitFlyNet

Record keeping of professional use of PPPs
Evaluate success

- **Monitor the use and result of plant protection methods applied and check for success is essential**
- **Record-keeping system should be easy and quick to use in the field.**
- **A system of displaying the information collected is needed for ease in decision-making**

Record keeping of professional use of PPPs
Evaluate success

- **Checking the success important because**
- **IPM is a continuous process that always needs improvements**
- **The knowledge of the success of the plant protection measures applied is a key element to achieve this improvement**
- **The maintenance of farm record in field books allows a detailed study of the reasons of failures that might have occurred, and the proposal of corrective actions**

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Organic Farming

- **Organic production is an overall system of farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preference of certain consumers for products produced using natural substances and processes.**

Organic Farming

- **Prohibition on the use of GMOs.**
- **Use tillage and cultivation practices**
- **multiannual crop rotation including legumes and other green manure crops**
- **prevention of damage caused by pests, diseases and weeds rely primarily on the protection by natural enemies, the choice of species and varieties, crop rotation, cultivation techniques and thermal processes;**

Organic Farming

- in the case of an established threat to a crop, plant protection products may only be used if they have been authorised for use in organic production under Article 16;
- products for cleaning and disinfection in plant production shall be used only if they have been authorised for use in organic production under Article 16

Organic Farming

- **Organic pesticides**
- **Organic pesticides are naturally derived rather than synthetically produced, but this does not tell us anything about their relative safety or impact on the environment.**
- **the most toxic substances known are found in nature: in other words, natural does not always equal safe**

- **PPPs must first of all be authorised under**

REGULATION (EC) No 1107/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the placing of plant protection products on the market

Organic Farming

REGULATION (EC) No 889/2008	Pesticide
Azadirachtin extracted from Azadirachta indica (Neem tree)	Insecticide
Gelatine	Insecticide
Plant oils (e.g. mint oil, pine oil, caraway oil).	Insecticide, acaricide, fungicide and sprout inhibitor.
Pyrethrins extracted from Chrysanthemum cinerariaefolium	Insecticide
Rotenone extracted from Derris spp. and Lonchocarpus spp. and Terphrosia spp.	Insecticide
Copper in the form of copper hydroxide, copper oxychloride, (tribasic) copper sulphate, cuprous oxide, copper octanoate	Fungicide.
Fatty acid potassium salt (soft soap)	Insecticide
Lime sulphur (calcium polysulphide)	Fungicide, insecticide, acaricide
Paraffin oil	Insecticide, acaricide
Sulphur	Fungicide, acaricide, repellent

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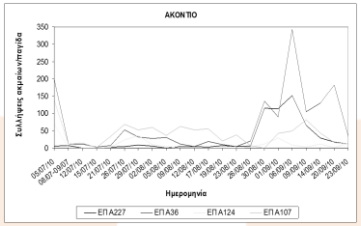
ECOPEST



Baseline, plant protection problems (survey)

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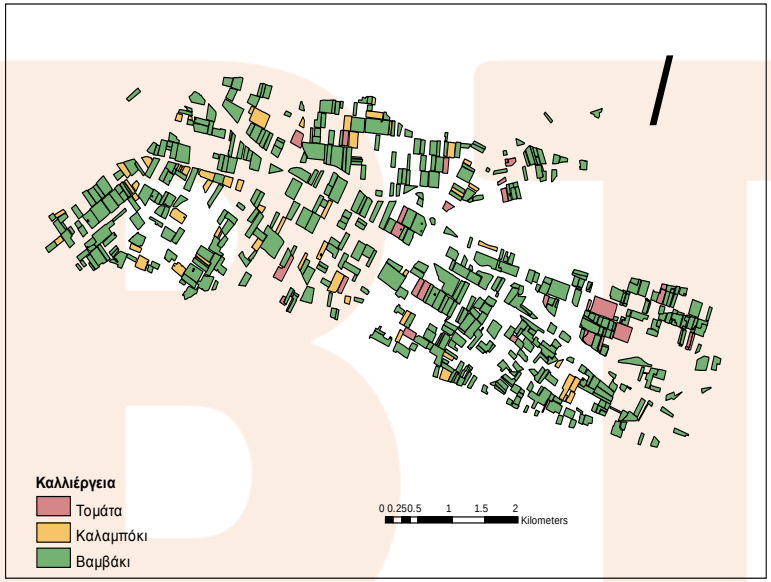

- Historical data Inputs & problems (questionnaire)
- Pesticide usage through specific form
- Connection of pesticide usage with individual fields

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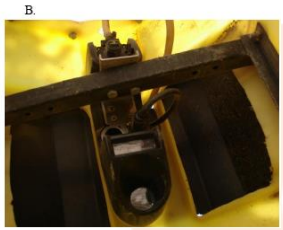
ECOPEST

…Application of the IPM



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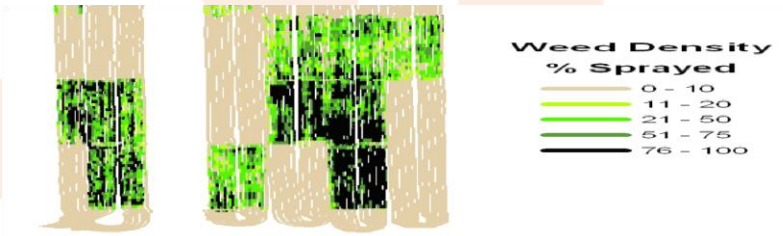
ECOPEST

IPM strategy: herbicides

Band applications: ~60% reduction

Weed seeker = 10-90% reduction



Integrated Pest Management is not only individual application

- **National Action Plans**
- **Providing**
  - Update information
  - Tools for pest monitoring
  - Tools for decision making

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www.magrama.gob.es/es/agricultura/temas/sanidad-vegetal/productos-fitosanitarios/guias-gestion-plagas/

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Atención al ciudadano

Inicio › Agricultura › Sanidad vegetal › Medios de defensa fitosanitaria › Guías de Gestión Integrada de Plagas

Agricultura

Ir a Sanidad vegetal

- Medios de defensa fitosanitaria
- Registro de productos fitosanitarios
- Registro de determinados medios de defensa fitosanitaria (MDF)
- Uso sostenible de productos fitosanitarios
- Guías de Gestión Integrada de Plagas
- Registro oficial de productores y operadores de medios de defensa fitosanitaria (ROPO)

Ir a Sanidad vegetal

Guías de Gestión Integrada de Plagas

Imprimir · Descargar en PDF · Ayuda

Las guías de Gestión Integrada de Plagas (GIP), tienen como finalidad servir de orientación a agricultores y asesores para conseguir implantar los principios de gestión integrada de plagas en toda la producción agrícola nacional, uno de los requisitos para todas las explotaciones agrícolas que desarrollen su actividad en España, según el Capítulo III del Real Decreto 1311/2012, de 14 de septiembre, por el que se establece el marco de actuación para conseguir un uso sostenible de los productos fitosanitarios.

En el Plan de Acción Nacional para el Uso Sostenible de Productos Fitosanitarios, aprobado en Conferencia Sectorial de Agricultura y Desarrollo Rural en diciembre de 2012, concretamente en la medida 3.1, ya se prevela la elaboración de las guías de gestión integrada de plagas, durante el periodo de vigencia del Plan.

Guía GIP UVA DE TRANSFORMACIÓN
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30/01/2015
El Ministerio de Agricultura, Alimentación y Medio Ambiente publica en su página web los Estudios de Costes y Rentas de las Explotaciones Agrarias (ECREA)

29/01/2015
García Tejerina: "La nueva PAC consolida una agricultura activa, más productiva y más competitiva"

Noticias sobre Agricultura

Ver todas las noticias

Destacados

Cursos sobre el uso sostenible del tractor agrícola

Aprobados los requisitos para las normas de comercialización del vino en caso de perturbación del mercado
(199,69 kb)

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Thank you for your attention

Questions ??

This training is carried out by GIZ GmbH under the contract no 2013 96 11 with the Consumers, Health and Food Executive Agency (former Executive Agency for Health and Consumers).

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