

# IPM OF SOLANACEOUS CROPS IN EMILIA ROMAGNA REGION, ITALY

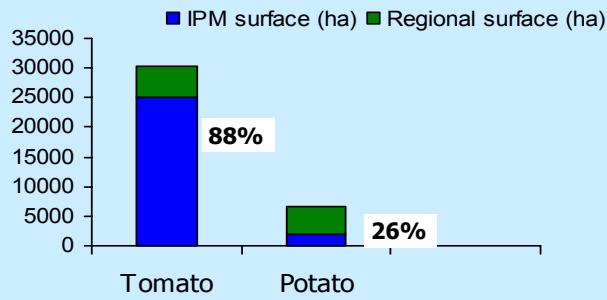
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## IPM in Emilia-Romagna Region

Tomato and potato are the solanaceous crops mostly grown in the region with 47 and 12 % regional surface grown with vegetables (64.000 ha) respectively. In the early '90 in Emilia-Romagna IPM guidelines for the most important vegetable crops were set up with the aim to reduce the environmental impact, protect farmer and consumer's health, and promote guaranteed quality production along with farmer's income. At present, the Integrated Production Guidelines are applied on 32 vegetables covering 49% of the regional agricultural surface (31913 ha) Tomato is the most extensively crop grown following IPM guidelines (25087 ha which means roughly 88% of the tomato grown in the region) Potato crop grown following IPM guidelines is 1.800 ha (26% of the potato grown in the region) because the crop is not included in the UE reg. n.2200/96, one of the measures Emilia-Romagna region uses to promote the Integrated Production.

## Incidence of IPM on solanaceous crops



## MEASURES USED TO PROMOTE INTEGRATED PRODUCTION OVER THE TIME

Measures	Benefit for farmers
Reg. CE 2078/92	Financial support
Reg. 2200/96 (OCM)	Qualified technicians
L.R. n. 29/98	Research, Experimentation, Supervisors, Technical supports
L.R. n. 28/98	Qualified technicians
Reg. CE 1257/99	Financial support
L.R. n. 29/99	Quality control the production label

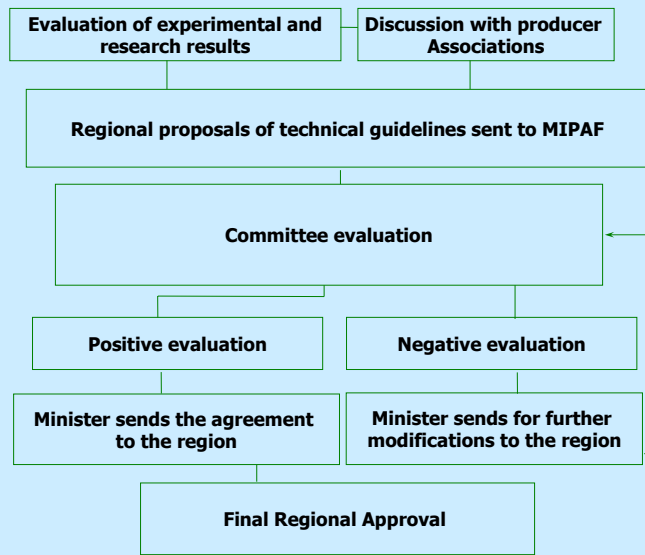
## CRITERIA FOR LIMITING PESTICIDE USE

General criteria defined by E.U. and recognized by Minister of Agricultural and Regional Governments. Decision n. 96/3864 of U.E. STAR Committee on 31/12/96. Strategies are defined for every crop in order to prevent or contain pests and diseases by using agronomic, biological, biotechnological techniques and limiting the number of chemical applications.

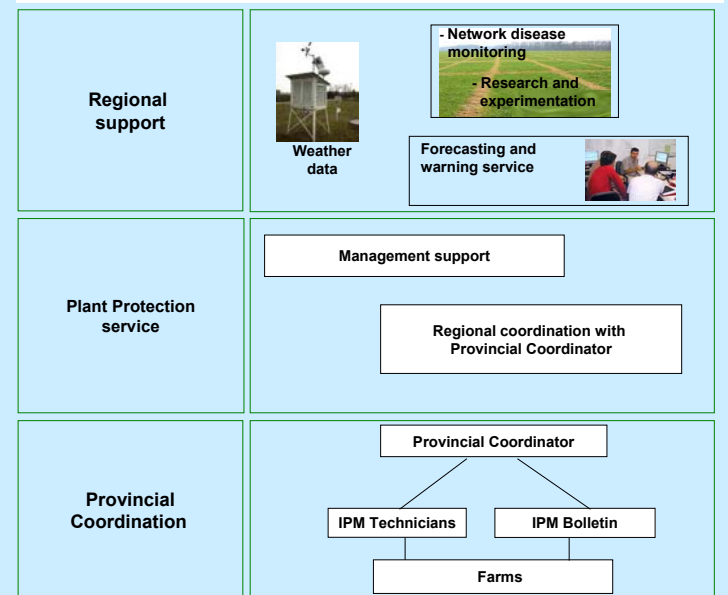
### Limitation or avoidance of chemical use are based on:

- **Toxicology**
  - Risk sentences on the product's label: formulations with R48 R40, R68, R61, R62, R63 should be avoided or limited;
  - Toxic marks on the label: formulation classified as T, T+ e Xn should be avoided or limited;
- **Environment**
  - Negative effects on no-target organism,
  - waterflows, soil and persistence in the environment
- **Residues on treated crops**
- **Selectivity for beneficials**
- **Risk of resistant populations**

## ITER FOR TECHNICAL GUIDELINES DEFINITION



## ORGANIZATION SYSTEM OF INTEGRATED PEST MANAGEMENT IN EMILIA ROMAGNA



## Tomato IPM Guidelines

Disease	Criteria for disease control	Active Ingredients	Spray limitations
<i>Phytophthora infestans</i>	<b>Start sprays on the bases of IPM bulletin</b> The bulletin considers information provided by forecasting model and field surveys on unsprayed plots  After the crop emergence copper compounds should be applied. With rapid crop growth and wet climate, systemic fungicides should be preferred, while close to the harvest fungicides with a short safety time should be applied.	Copper compounds Dodine Metalaxil-M (1) Benalaxil (1) (Benalaxyl M(1)+Mancozeb)(9) Dimetomorph (2) Cymoxanil (3) Azoxystrobin (4) (6) (Pyraclostrobin (5)(6) + Metiram (9)) Fosetyl-Al Iprovalicarb (7) Zoxamide-Mancozeb (8) Mancozeb (9) Metiram (9)	(1) Max 3 applications/year with phenylamide (2) Max 3 applications/year (3) Max 3 applications/year (4) Max 2 applications/year independently by disease (5) Max 3 applications/year independently from the disease (6) Max 3 applications/year independently from the disease (7) Max 3 applications/year (8) Max 3 applications/year (9) Max 3 applications/year independently from the disease Stop spraying 21 days before harvest
<i>Alternaria solani</i>	<b>Agronomic measures:</b> - use healthy seed - long crop rotations - avoid waterlogging and limit the irrigations <b>Chemicals:</b> - usually specific sprays are not necessary in that those carried out against late blight are able to control early blight as well - in case of heavy attacks and in humid areas two sprays when first symptoms occur with 8-10 days interval are recommended	Copper compounds Azoxystrobin (1) (3) (Pyraclostrobin (2)(3) + Metiram (4))  Difenconazole (5)	(1) Max 2 applications/year independently from the disease (2) Max 3 applications/year independently from the disease (3) Max 3 applications/year independently from the disease (4) Max 3 applications/year independently from the disease Stop spraying 21 days before harvest (5) Max 3 applications/year

IPI and MISP forecasting model is a tool to provides farmers and field technicians about the blight risk and the optimal time to spray.

On potato crops, it has been using since 1995 and over the years proved to be usefull to save from 30 to 60% of fungicide applications

## Potato IPM Guidelines

Disease	Criteria for disease control	Active Ingrid.	Spray Limitations
<i>Phytophthora infestans</i>	<b>Agronomic measures:</b> - use of healthy seeds - use of unscetipible varieties - elimination of volunteer potato plants - long rotations - avoid exceeding nitrogen fertilization - avoid dense stands <b>Chemicals:</b> - first sprays when climatic conditions are favourable for infections or on the basis of forecasting model - following sprays should be carried out with 6-10 days interval on the bases of fungicide persistence or on forecasting model	Copper compounds Dodine Fosetyl Al+Cu oxychl. Fluazinam Cymoxanil (1) Metalaxyl-M (2) Benalaxyl (2) (Benalaxyl M(2)+ Mancozeb)(7) Dimetomorph (3) Iprovalicarb (5) Zoxamide-Mancozeb (6)(7) Mancozeb (7)	(1) max 3 application/year (2) max 3 application/year with fenilamides and with Xi formulations only. (3) max 3 application/year (5) max 3 application/year (6) max 3 application/year (7) max 3 application/year  Stop spraying 21 days before harvest
<i>Alternaria solani</i>	<b>Agronomic measures:</b> - long rotations - use of healthy seeds <b>Chemicals:</b> - Specific sprays are needed only on infected young plants, as fungicides used against late blight are able to control the early blight as well.	Copper compounds	

## Potato - Average reduction of treatments (%)

