ORGANIZATION SYSTEM OF INTEGRATED PEST MANAGEMENT

Bugiani R. & T. Galassi
“Componenti del sistema organizzativo della produzione integrata”

- Research & experimentation
- Qualified field technicians
- Relationship with other regions
- Relationship With chemical firms
- Extension for farmers
- Extension support
- Extension supervision
- I.P.M. system
- Extension for farmers
- Extension support
- Extension supervision
# Roles in IPM Programmes

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.P.S.</td>
<td><strong>Knowledge organization</strong>&lt;br&gt;Carrying out and supervision of experimental projects</td>
</tr>
<tr>
<td>Provincial supervisors</td>
<td>Guidelines build-up&lt;br&gt;Supports management and guidelines supervision</td>
</tr>
<tr>
<td>P.O. technicians</td>
<td>Field technician supervision&lt;br&gt;Trade-union with farmers</td>
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</tbody>
</table>
ORGANIZING SYSTEM in Emilia-Romagna

Research and experimentation programmes with result diffusion

- 130 researches and experimentations directed by P.P.S. and founded by € 1.132.00 (2002) now only € 750.00
- 15 internal meetings
- 12 researchers in Regional Service
- 2 Universities (Bologna and Piacenza)
- Others Institutions and Research Centre
**ORGANIZING SYSTEM in Emilia-Romagna**

**Appropriate supports**

<table>
<thead>
<tr>
<th>Regional meteorological service (ARPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meteo information for whole regional area (quadrants km. 5 x km. 5)</td>
</tr>
<tr>
<td>Analytical weather forecasting of temperature and rain: three days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agricultural Information software</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIAS (Global Information Agricultural Service)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>(specific new programme)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Forecasting and advisor System</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 forecasting model and 11 in development</td>
</tr>
</tbody>
</table>
### Forecasting and warning system “Monitoring web”

<table>
<thead>
<tr>
<th>From technicians</th>
<th>Particular observations</th>
<th>Unsprayed plots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Spore-traps</strong></td>
<td></td>
</tr>
</tbody>
</table>
| • Adult captures by traps (OFM, Cm, leafrollers, etc.) | *Stemphylium vesicarium*  
Brown spot  
*Venturia inaequalis*  
Apple scab  
*Puccinia recondita*  
f.sp. *tritici*  
Brown rust  
*Phytophthora infestans*  
Potato and Tomato Late blight | *Grapevine downy mildew*  
Potato and Tomato Late blight  
Onion downy mildew  
Apple scab (apple and pear)  
Brown spot  
Peach Leaf Curl  
*Cercospora* leaf spot  
Brown rust  
Cm eggs |
| • Normal sampling (routinely visual survey) |             |                 |
| • Specific sampling and observations (es. Cm, ecc.) |             |                 |
Forecasting and warning system

- Currently use
  - Plant diseases
    - 10 models
  - Insects
    - 6 models

- NEW MODELS IN PROGRESS
  - Plant diseases
    - 6 models
  - Insects
    - 5 models
Forecasting and warning system
“Monitoring web - plant diseases”

- *Cercospora beticola* (Cercospora leaf spot)
- *Puccinia recondita* (Brown rust)
- *Erysiphe graminis* (Powdery mildew)
- *Peronospora destructor* (Onion downy mildew)
- *Phytophtora infestans* (Potato and Tomato Late blight)
- *Venturia inaequalis* (Apple scab)
- *Stemphylium vesicarium* (Brown spot)
- *Erwinia amylovora* (Fire blight)
- *Plasmopara viticola* (Grapevine downy mildew)
Forecasting and warning system
“Monitoring web – insects”

- *Lobesia botrana* (grapevine moth)
- *Cydia pomonella* (Codling moth)
- *Cydia molesta* (Oriental fruit moth)
- *Argyrothaenia pulchellana* (Grape tortrix)
- *Pandemis cerasana* (Barred fruit tree tortrix moth)
- *Cydia funebrana* (Plum moth)
Forecasting and warning system
“Monitoring web – new models in progress”

- *Leptinotarsa decemlineata* (Colorado potato beetle)
- *Anarsia lineatella* (Peach twig borer)
- *Cacopsylla pyri* (Pear psylla)
- *Aphids of horticultural crops*
- *Liriomyza huidobrensis*
- *Uncinula necator*
- *Botrytis cinerea*
- *Taphrina deformans*
- *Erysiphe graminis*
- *Fusarium culmorum*
Technical assistance to the growers by qualified technicians

<table>
<thead>
<tr>
<th>Technicians</th>
<th>Nº Technician</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field technicians</td>
<td>280 (*)</td>
<td>Private IPM</td>
</tr>
<tr>
<td>Coordinators</td>
<td>115 (**)</td>
<td>Other private Th.</td>
</tr>
<tr>
<td>Supporters</td>
<td>12</td>
<td>Private IPM</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Public Adm.</td>
</tr>
</tbody>
</table>
Coordination of the organization system in Emilia-Romagna

Every week = Regional meeting
(Regional experts and Managers from each Province - 30 every year)

Every week = Provincial meeting
(Managers from each Province and technicians - 320 every year)

Assistance service:
- Farmer visit (routinely)
- Every week = Provincial Bulletin (about 230 every year by (paper -
  newspaper - local tv - Internet - SMS - phone-answering machine)
- Specific news = every day on Internet
**ORGANIZING SYSTEM in Emilia-Romagna - year 1999**

**Impact evaluation of IPM programme (toxicity class of insecticides)**

Differences (%) between IPM farms and traditional ones

<table>
<thead>
<tr>
<th>1999</th>
<th>Total</th>
<th>Without B</th>
<th>B</th>
<th>Nc</th>
<th>Xi</th>
<th>Xn</th>
<th>Te</th>
<th>T+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pear</td>
<td>gr/ha</td>
<td>-15</td>
<td>-33</td>
<td>-1</td>
<td>-36</td>
<td>-12</td>
<td>-73</td>
<td>-78</td>
</tr>
<tr>
<td>Peach</td>
<td>gr/ha</td>
<td>-24</td>
<td>-50</td>
<td>-17</td>
<td>-9</td>
<td>-38</td>
<td>-78</td>
<td>-79</td>
</tr>
<tr>
<td>Vineya</td>
<td>gr/ha</td>
<td>9</td>
<td>-45</td>
<td>31</td>
<td>-33</td>
<td>-44</td>
<td>-97</td>
<td>-100</td>
</tr>
</tbody>
</table>

B = biological products

Sample: about 1000 ha
Impact evaluation of IPM programme
(toxicity class of insecticides) 1998
Differences as % between IPM farms and
traditional ones

Apple
Pear
Peach
Grape
Impact evaluation of IPM programme (toxicity class of insecticides) 1999
Differences as % between IPM farms and traditional ones
Impact evaluation of IPM programme (toxicity class of insecticides) 2002
Differences as % between IPM farms and traditional ones

Pear
Peach
Grapevine
Impact evaluation of IPM programme (toxicity class of insecticides) 2003
Differences as % between IPM farms and traditional ones
I.P.M. in Emilia-Romagna Region

**Fruit orchards**

- Soil choice
- Rootstock choice
- Cultivar choice
- Fertilization
- Irrigation
- Soil management
- Impollinazione e diradamento
- Pruning
- Harvest guidelines
- Plot management
- Shelf-life management
- Traceability
I.P.M. in Emilia-Romagna Region

Internet

http://www.ermesagricoltura.it/wcm/ermesagricoltura/consigli_tecnici/disciplinari/sezione_disciplinari.htm