Agricultural Production monitoring, Forecasting Networks and IPM in I.R. of Iran

by:
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Different crops can be cultivated in Iran. The total area is more than 14.5 million hectares that 82% of which belong to field crops and 18% to orchard crops.
• The number of major plant pests are 607.
• 50 percent are insects, mites, rodents and birds
• 27% are diseases (bacteria, fungi, nematodes, viruses, mycoplasmas, etc ....)
• 13% are weeds.
The area under chemical control against plant pests is 16 million ha.

- 88% belongs to field Crops
- 12% go to orchard crops
• 26000 tons of pesticides are used every year on field and orchard crops taking a share of 73% and 27%, respectively.
251 kinds of pesticides are registered in Iran.
9% of the registered pesticides used belong to the hazard group I
27% to the hazard group II
64% to the hazard groups III, IV and V.
In 1996

16% of the registered pesticides belong to the hazard group I
47% To the hazard group II
37% to the hazard groups III, IV and V.
Until 2005, governmental sector was the major actor for the agricultural pesticides purchasing activities
This method had the following problems including:

- Pesticide production was not competitive.
- Pesticide distribution was not sufficient due to the limited government funding.
- There was little pesticide diversity due to lack of market competition.
Pesticide purchase and distribution was handed over to the private sector in 2005 with the following objectives:
• To enhance Pesticide quality.
• To have a competitive production.
• To register and supply pesticides under brand name
• To make the private sector involved.
• To orient pesticide subsidies towards promotion of non–chemical control and strengthening of agricultural production monitoring and forecasting networks.
• To reduce dose and application in view of higher–priced pesticides while making professional recommendations available to farmers.
• To prevent obsolete pesticide build up.
• To develop agricultural pesticides exports
• To encourage private sector to invest.
• To diversify pesticides to prevent pest resistance.
• To reduce government involvement.
• To make possible timely provision of sufficient amounts of pesticides to farmers.
• To enhance pesticide quality in view of a competitive market.
• To make the private sector involved in a competitive arena.
The subsidies on pest control chemicals were channeled in the following services to the formers:

- Setting up privately-owned monitoring and forecasting networks and constant tracing of plant pathogens.
- Studying the biology of plant pests for best timing and method of control.
- Promoting non–chemical control materials in farms, orchards and greenhouses.
- Purchasing non–chemical control materials and agents and making them available to the farmers free of charge.
• Using an online system of pesticide monitoring and tracing (from production to use) throughout the country
• Holding workshops for 4500 private plant protection experts.
• Setting up monitoring and forecasting networks in an area of 2 million ha through putting to work the 4500 trained plant protection experts in private plant protection clinics.
• Introducing new IPM methods in farms, orchards and greenhouses.
Activities that must be carried out by monitoring and forecasting networks:

• Regular monitoring of fields and orchards to study the biology and life cycle of pests in the context of regional climatic conditions.
• Preparing identification documents for infected regions defining the level of infection in different seasons.
• Filling out information forms.
• Identifying the time and method of pest control to be transmitted to farmers.
• Preventing calendar – based and untimely use of pesticides in order to raise effectiveness of control.
• Observing the rules of IPM in fields and orchards leading to minimized pesticide use and applications and making use of biological materials and agents instead.

• Supervising complete observance of optimized agriculture as well as non–chemical control methods such as mechanical, cultural and biological control methods and use of pheromone and adhesive traps from the time of planting until harvest.

• Encouraging farmer participation and training.
Status of biological control programs:

- Biological control is being carried out in an area of 165000 ha during the current cultivation year (2007-2008).
- 147500 ha of the controlled area belongs to field crops such as rice, cotton, maize, tomato, Soya, sugar cane and rain fed chickpea.
- 18000 ha of orchard crops such as citrus, tea, mulberry, pomegranate, pistachio and apple are under biological control.
<table>
<thead>
<tr>
<th>Crop</th>
<th>Target pest</th>
<th>Bioagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td><em>Chilo suppressalis</em></td>
<td><em>Trichogramma brassicae</em></td>
</tr>
<tr>
<td>Cotton</td>
<td><em>Heliothis armogera</em></td>
<td><em>Trichogramma spp</em></td>
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<tr>
<td></td>
<td><em>Heliothis armogera</em></td>
<td><em>Habrabracon spp</em></td>
</tr>
<tr>
<td></td>
<td><em>Mites &amp; sucking pests</em></td>
<td><em>Chrysoperla carnea</em></td>
</tr>
<tr>
<td>Corn</td>
<td><em>Ostrinia nubilalis</em></td>
<td><em>Habrabracon hebetor</em></td>
</tr>
<tr>
<td></td>
<td><em>Heliothis armogera</em></td>
<td><em>Trichogramma spp</em></td>
</tr>
<tr>
<td>Tomato</td>
<td><em>Heliothis armogera</em></td>
<td><em>Habrabracon hebetor</em></td>
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<tr>
<td>Soybean</td>
<td><em>Heliothis armogera</em></td>
<td><em>Trichogramma spp</em></td>
</tr>
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<td></td>
<td></td>
<td><em>Habrabracon spp</em></td>
</tr>
<tr>
<td>Pea</td>
<td><em>Heliothis armogera</em></td>
<td><em>Habrabracon hebetor</em></td>
</tr>
</tbody>
</table>
# Biological Control Agents in Horticulture Crops

<table>
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<tr>
<th>Crop</th>
<th>Target pest</th>
<th>Bioagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus</td>
<td><em>Pseudococcus maritimus</em></td>
<td><em>Cryptoleamus montrouzieri</em></td>
</tr>
<tr>
<td>Tea</td>
<td><em>Pseudococcus maritimus</em></td>
<td><em>Cryptoleamus montrouzieri</em></td>
</tr>
<tr>
<td>Mulberry</td>
<td><em>Pseudococcus pentagoni</em></td>
<td><em>Prospaltella belesi</em></td>
</tr>
<tr>
<td>Pomegranate</td>
<td><em>Spectrobates ceratoniae</em></td>
<td><em>Trichogramma embrophayum</em></td>
</tr>
<tr>
<td>Pistachio</td>
<td><em>Aganoscena pistachiella</em></td>
<td><em>Chrysoperla carnea</em></td>
</tr>
<tr>
<td>Apple</td>
<td><em>Laspeyresia pomonella</em></td>
<td><em>Trichogramma spp</em></td>
</tr>
</tbody>
</table>
Pesticide privatization, monitoring and forecasting networks and biological control have resulted in 3000 tons pesticide use-reduction.
Plant protection Organization of the I.R. of Iran plans to expand the IPM area to:

1. Cover freshly – consumed strategic crops which have not had chemical control before.
2. Minimizing agricultural pesticides use in fields, with best timing, to result in minimum pesticide residue.
3. Monitoring pesticides and hazardous chemicals residue in the framework of monitoring networks from planting, until harvest.
Thank you