

# POSITION PAPER ON INTEGRATED PEST MANAGEMENT

## THE CHALLENGE – SUSTAINABLE AGRICULTURE IN ASIA

In the next 50 years, the world's population is set to rise from its present six billion to over 10 billion – the fastest rate of increase in any half century ever. By 2025 alone, there will be an additional one and one half billion people to feed with virtually no additional land available for cultivation without serious forestry encroachment, and the resulting environmental effects.

At present Asia covers only 30 % of the world's landmass, but feeds 60 % of the population. As global population increases, there will be an overwhelming need to cultivate more food from existing land, and yet farmers efforts to produce more are already hindered by a wide range of factors:

- Yield losses from pests, and from soil problems (such as infertility and salinity)
- High rates of land degradation
- Water scarcity
- No new land frontiers without major adverse impact on environment (further loss of natural habitat).

In 1992, 178 nations convened at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, and adopted Agenda 21, a 300-page plan for achieving *sustainable development* in the 21st century. The Commission on Sustainable Development (CSD) was created in December 1992 to ensure effective follow-up of UNCED. The model of *sustainable development* laid down in detail by Agenda 21 provided for the use of Integrated Crop Management (ICM), of which Integrated Pest Management (IPM) is seen as one of its more vital elements.

CropLife International (the global federation for the plant sciences industry) at its Brussels meeting in June 2001 re-iterated its strong commitment to both ICM and IPM. It called on all of its member companies to incorporate these philosophies into their corporate cultures, and more particularly, into their marketing practices.

In Asia, APCPA fully supports the FAO International Code of Conduct on the Distribution and Use of Pesticides, and in particular, seeks to promote IPM as so defined within its spheres of influence.

*"In the next 25 years, farmers in Asia must increase cereal yields by 50%-75 %."*

**NORMAN BORLAUG, NOBEL LAUREATE  
ADB SPEECH,  
MANILA. APRIL 1999**

*DEFINITION: Integrated Pest Management (IPM): A pest management system that, in the context of the associated environment and the population dynamics of the pest species, utilises all suitable techniques and methods in as compatible a manner as possible and maintains the pest populations at levels below those causing economically unacceptable damage or loss.*

**FAO INTERNATIONAL CODE OF CONDUCT  
ON THE DISTRIBUTION AND USE OF PESTICIDES**

# WHAT IS INTEGRATED PEST MANAGEMENT

In its simplest terms, IPM is a means for growing a healthy crop using a rational combination of techniques for protecting the crop. The IPM approach empowers farmers to control diseases, insects, weeds and other pests in a sustainable way so that they are contained at levels that are not economically or (in the case of amenity horticulture) aesthetically important. At the same time IPM helps to maximize biodiversity within the agro-ecosystem, and minimize the environmental impact of farming.

The key words of the definition are “*all suitable techniques*”. Successful practitioners of IPM evaluate the potential cost effectiveness of each alternative as well as the whole control strategy.

Accountability for implementation of IPM ultimately rests with the farmer. A strategy will only be adopted if it is seen to be practical and to add value to farm output.

The range of techniques is split between those that are preventative (or indirect) crop protection measures and those that are interventional (or direct) measures.

## PREVENTATIVE (INDIRECT) CROP PROTECTION MEASURES

These include time-honoured agronomic treatments like breeding, crop rotation, irrigation management, and effective crop husbandry. They also include practices that maintain adequate populations of beneficial insects. New technologies also come into play:

- Host plant resistance (HPR): Host plant resistance to pathogens has now been shown to be effective in the field, with 10m ha of blast-resistant rice grown worldwide, reducing or eliminating the need for fungicides; the value of HPR for insect control is likely to become a second cornerstone for IPM.
- Biotechnology: Biotechnology provides the means to precisely tailor plant cultivars to enhance the durability / stability of HPR, allowing cultivation of ‘multivars’ of crops, which incorporate a variety of resistance mechanisms, whilst maintaining phenotypic and agronomic uniformity; management of hitherto intractable problems such as plant viruses, is now feasible through the introduction of specific resistance genes from outside the crop’s immediate genome.
- Genomics, Bioinformatics: Biotechnology has not only provided the means to modify genotypes, but rapid advances in the underlying sciences of genomics and bioinformatics offer considerable insight into fundamental mechanisms in ecology and evolution. Such understanding will certainly be of immense value to researchers in their quest for highly productive, environmentally friendly and sustainable agricultural systems.

## INTERVENTIONAL (DIRECT) PROTECTION MEASURES

These include chemical control; bio-control, for example, using an insect predator to control a pest; and cultural and sanitation methods that remove alternative host plants and destroy pest habitat. Again new technologies come into play.

Integrated Pest Management is an important part of long-term sustainable world agriculture. This is endorsed by the FAO World Food Summit and the Rio Environmental Conference.

Integrated Pest Management as part of a wider Integrated Crop Management concept is supported as a national crop protection policy by many governments in the Asian region. It is regarded as a *proven tool for increasing food production*, and thus food security whilst preserving the environment. However the benefits are far more widespread (see over):

*A doubling of rice yields per unit area is needed in irrigated and rainfed rice lowlands in the next 20 years!*

**M. HOSSAIN**  
INTERNATIONAL RICE RESEARCH  
INSTITUTE 1999

## **BENEFITS OF INTEGRATED PEST MANAGEMENT**

### **To FARMERS**

- Increased profitability through improved yields, produce quality and tolerance to stress factors
- New added value crops offer new market opportunities
- Optimum usage of pesticides
- Reduced severity of pest levels

### **To CONSUMERS**

- Better quality food and fibre products
- Better food safety standards
- Lower levels of anti-nutritional and allergenic substances
- Increased food security for rural and urban poor, who represent the majority of the Asia-Pacific region's population

### **To NATIONAL GOVERNMENTS**

- Meeting social and welfare objectives and, more particularly, contributing to poverty reduction objectives
- Strengthening rural economies
- Strengthening national agricultural research and development services
- Contributing to environmental sustainability objectives

### **To THE ENVIRONMENT**

- Increased productivity of existing farmed land which reduces the pressure to farm marginal land and fragile ecosystems
- Improve agricultural sustainability
- Elimination of unnecessary agricultural inputs lowers the risk of disturbing the natural ecological balance

*"Governments are urged to promote the safe and sustainable use of plant protection products and plant nutrients in agricultural production, and to strengthen practical ways to enhance the application of ICM and IPM. All stakeholders, including farmers, the private sector and international organisations, are encouraged to form effective partnerships with governments, including those that provide capacity building assistance for this purpose."*

**COMMISSION ON  
SUSTAINABLE DEVELOPMENT, 2000**

## BRINGING INTEGRATED PEST MANAGEMENT TO THE ASIA-PACIFIC REGION

Effective IPM programmes demand an integration of information about the crop plants, the pests, the environment and the available pest management methods. Consequently, training of farmers is vital so that they can be self-empowered.

The challenge of training hundreds of millions of Asian farmers demands the commitment of enormous resources and a combined approach of the private and public sectors including government extension services, multilateral agencies (e.g. FAO, World Bank, CGIAR) and NGO's, educational institutes and the plant sciences industry. APCPA seeks such a partnership approach with such organisations.

### GOVERNMENTS

Most Asian countries have adopted IPM as the official national crop protection policy, based on principles of season-long farmer participatory training advocated by FAO and others. Nevertheless, practical implementation has often fallen short of expectations and, in the past, enthusiastic extrapolation and promotion of local success stories have not generally been helpful in gaining political support in the longer run.

### NGOs

We recommend that all NGOs working with farmers in Good Agricultural Practice have a consistent approach to the implementation of IPM.

### EDUCATIONAL INSTITUTES

There needs to be broader funding, and a wider approach to educating both farmers and agricultural professionals. Local education institutes (universities, colleges of agriculture) should work along side pan-Asian educational institutes such as the Asia-Pacific Regional Technology Centre, to broaden access to and adoption of IPM technologies by Asia's smallholder farmers .

### INDUSTRY

The private sector produces most of the modern target-specific, environmentally friendly, IPM-compatible products underpinning successful cropping practices. The challenge the plant sciences industry now faces is to demonstrate the value of practical, science-based IPM models, tied in with cost-effective systems for transferring the necessary knowledge for more widespread field adoption.



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