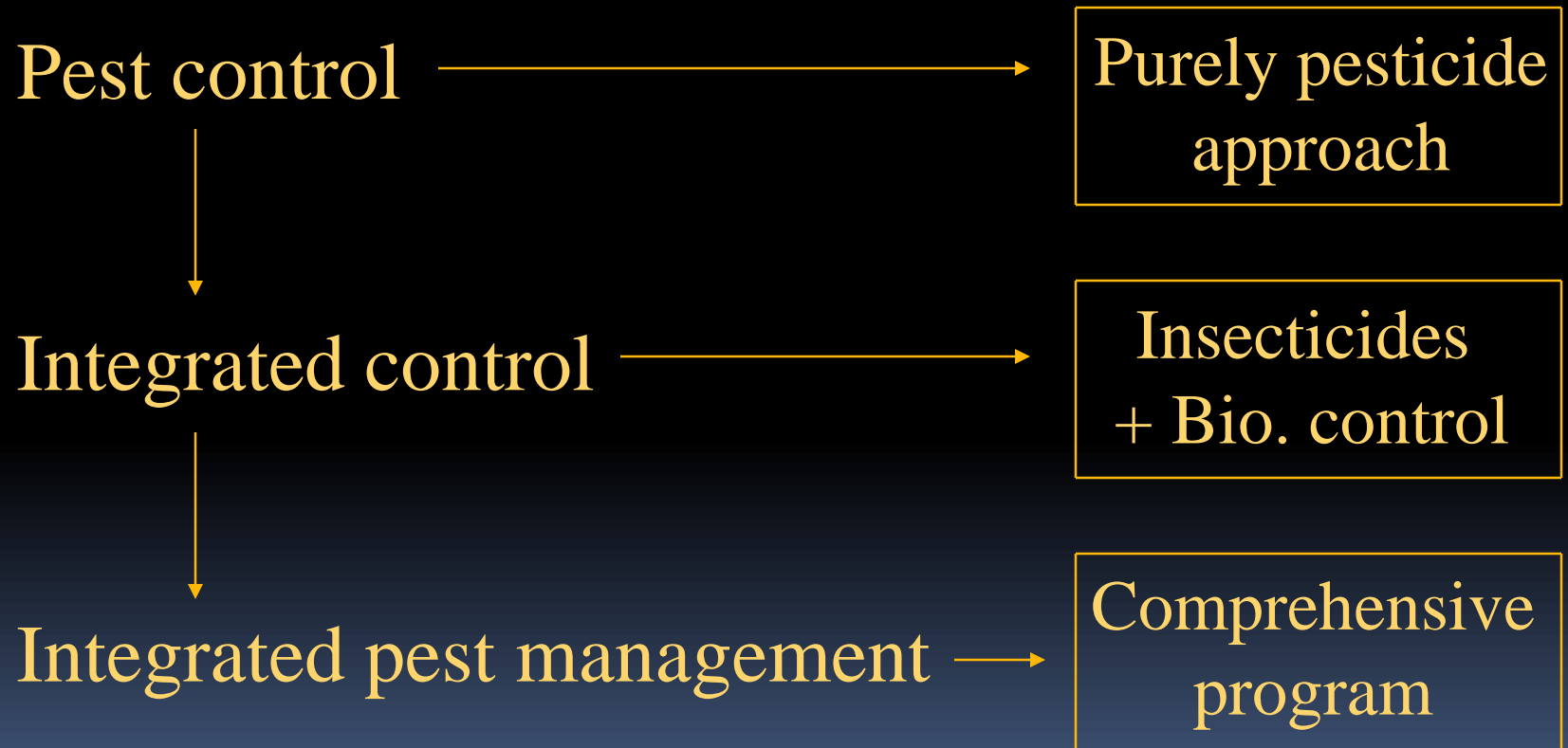


Lecture I: Integrated Pest Management



Key terms to be included in an IPM definition

- ✓ Comprehensive
- ✓ Multiple strategies
- ✓ Tolerable levels
- ✓ Environmental quality

IPM (definition)

- Integrated pest management is a comprehensive pest technology that uses a combination of techniques or strategies including monitoring, biological control, cultural practices, resistant varieties and pesticides to reduce pests' status to tolerable levels while protecting non-target organisms and maintaining the quality of the environment

Organic Agriculture

- Organic agriculture a sustainable approach to farming where farmers are not allowed to use synthetic pesticides or fertilizers
- Certified organic refers to agricultural products that have been grown and processed according to uniform standards, verified by independent state or private organizations accredited by the USDA

Characteristics of Organic Systems

- Description of the practices used in producing crops and livestock products
- A detailed record keeping system that tracks all products from the field to point of sale
- Maintenance of buffer zones to prevent inadvertent contamination by synthetic farm chemicals from adjacent conventional fields

Historical Highlights of Pest Management

- 2500 BC earliest record of pest control, use of sulphur (ancient Babylonians)
- 800 BC Egyptians and Chinese used insecticides formulated from herbs and oils for protection of seeds and stored grain.
- 300 BC the recognition of phenology as a science leading to timely planting to avoid pest losses.
- 300 BC the Chinese discovered biological control

Historical Highlights of Pest Management

- 1101 (A.D.) The Chinese had discovered the use of soap to control pests.
- 1600 - Nicotine from tobacco as well as arsenic were used to control pests.
- 1700s - Plant resistance to insects was introduced- Hessian fly, *Mayetiola destructor* in the US
- 1800s - 1900s - Rapid development of insecticides (petroleum and coal tar distillates, nicotine, arsenic)
- Europe - Development of commercial sprayers late 1800s and early 1900s.

1939-1962 Insecticide Era

- ❖ Discovery - of insecticidal properties of DDT
Swiss Chemist, Dr. Paul Muller (Geigy Corp)
- Identify the pest and finding most 'effective' chemical to control the pest
- Spraying on a calendar schedule without knowledge of pest phenology, density, or damage potential
- ❖ Discovery - insecticidal properties of organophosphates
German Scientist, Dr. Gerhard Schrader (Bayer Ag)

Problems Resulting from the Insecticide Era

- Frequent cases of insecticide resistance, secondary pest outbreaks, pest resurgence
- DDT and related compounds were discovered in milk and other foods as well as in food chains of predator birds and other wildlife
- Pressure from environmentalists
- The publication of a book “Silent Spring” by Rachel Carson

Emergence of Pest Management

- 1950 - 60s 'Integrated control' - combination of biological methods with chemical control strategies
- 1961 The term pest management was initially suggested by Australian entomologists, L. R. Clark and P. W. Geier who outlined the principles of pest management.
- Pest management differed from earlier concepts due to its holistic viewpoint.

Adoption of IPM programs through integration levels

❖ IPM program may evolved through a series of steps or integration levels

Level 1: Focuses on monitoring and managing a single species or species complex (blueberries - *Frankliniella* spp.)

Level 2: Determines how practices impact multiple pests (insects, pathogens and weeds) and focuses on complementary biologically based management options.

Level 3: Considers multi-strategies, multi-crop and multi-season are integrated into the decision making process

IPM Definitions

- Pest - is an organism that interferes with the availability, quality, or value of a manage resource

Key Pest

A perennial, severe pest that causes serious economic loses if left unmanaged

Secondary Pest

A minor pest usually kept in check by natural enemies. A secondary pest can become a major pest if pesticides used against a key pest destroys the natural enemies of the minor pest

Occasional Pest

Is a pest that causes in-frequent damage e.g. once every 3 years