

Exercise walk-through

# 5.14

## Integrated Pest Management

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AP Environmental Science

# What we will cover

- 1 The tragedy of the commons
- 2 Agriculture and food
- 3 Irrigation and water
- 4 Pest control and IPM
- 5 Harvesting resources
- 6 Urbanization and sustainability



# What pesticides cost, and what IPM does instead

## pesticides

raise yields, but harm non-target species and pollute water

## pesticide resistance

survivors breed, so stronger doses are needed – the **pesticide treadmill**

## integrated pest management

IPM: biological controls (natural predators), crop rotation, **limited targeted** pesticide, and monitoring

## why IPM wins

lower cost and lower environmental damage, and it does not breed resistance the way blanket spraying does

IPM is not 'no pesticides'. It is pesticide as the **last** tool rather than the first.

## Check yourself

- 1 In the commons, who gets the gain and who pays the cost?
- 2 Which irrigation method wastes the least water?
- 3 What does IPM do before spraying pesticide?
- 4 Name the three pillars of sustainability.



**Answers** 1. gain to one user, cost shared by all 2. drip 3. monitor pest numbers  
4. economic, social, environmental

## Exercises 2.1-2.3

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**2.1** What is the goal of IPM regarding pesticide use?

[1]

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**2.2** Name two non-chemical IPM methods.

[2]

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**2.3** When are chemicals used in IPM?

[1]

## Exercises 2.1-2.3

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**2.1** What is the goal of IPM regarding pesticide use? [1]

**2.1**

- To minimize pesticide use (use chemicals only as a last resort)
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**2.2** Name two non-chemical IPM methods. [2]

**2.2**

- Any two: biological control, traps/barriers, crop rotation, resistant varieties
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**2.3** When are chemicals used in IPM? [1]

**2.3**

- Only as a last resort, sparingly, when pests exceed a threshold

## Exercise 3.1

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**3.1** In IPM, chemical pesticides are used

[1]

☐

**A** first and heavily

**B** as a last resort, sparingly

**C** never

**D** to eliminate every pest

## Exercise 3.1

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**3.1** In IPM, chemical pesticides are used

[1]

☐

**A** first and heavily

**B** as a last resort, sparingly

**C** never

**D** to eliminate every pest

**3.1 B**

- as a last resort, sparingly

## Exercise 3.2 (a)

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**3.2** A farm switches from routine spraying to IPM.

(a) Describe two methods the farm might use.

[2]

## Exercise 3.2 (a)

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**3.2** A farm switches from routine spraying to IPM.

(a) Describe two methods the farm might use.

[2]

(a)

- Any two: release natural predators, use traps/barriers, rotate crops, plant resistant varieties

## Exercise 3.2 (b)

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**3.2** A farm switches from routine spraying to IPM.

(b) Explain why IPM reduces pesticide resistance.

[2]

## Exercise 3.2 (b)

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**3.2** A farm switches from routine spraying to IPM.

(b) Explain why IPM reduces pesticide resistance.

[2]

(b)

- Less pesticide use means less selection pressure on pests, so resistance develops more slowly

## Exercise 3.3

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**3.3** Explain why IPM aims to keep pests below a threshold rather than eliminate them.[2]

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**3.3** Explain why IPM aims to keep pests below a threshold rather than eliminate them.[2]

### **3.3**

- Eliminating pests entirely is costly and drives resistance; keeping them below a damaging threshold protects the crop while using far fewer chemicals