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Integrated Pest Management

IPM Manual for Home and Garden Pests in British Columbia

Study Question Answers

Chapter 1. What is Integrated Pest Management

1. g, f, d, e, i, a, c, b, h
2. Identification, monitoring, action decisions, treatment, evaluation.
3. Compare specimen with pictures, recognize characteristics of damage, cc for assistance.
4. To find out the extent of the pest problem and whether it is increasing or
5. The injury level is the unacceptable amount of injury or damage.
6. Prevention is important because preventive methods alone are often suffi pest populations at tolerable levels. These methods also make controls m and help prevent the recurrence of pest problems.
7. Biological control is the use of natural enemies to control pests. Recomm example of biological control useful in a home garden (list one): aphid mi coloured Asian lady beetle, predatory mites, insect parasitic nematodes.
8. The undesirable side effects of pesticide use include: development of pes that are resistant to pesticides, exposure of people, pets and other non-t organisms to potential health hazards, and environmental contamination
9. Preferred pesticides are the least toxic to humans, have the lowest impac target organisms, and are the most specific to the target species. Examp insecticidal soap, insect growth regulators, diatomaceous earth (silicon di
10. Dispensers should: ensure safe display and storage of pesticides at the v ensure customers know pesticides can be used only as stated on the labe to advise on pest management and prevention of pest problems.

Chapter 2. Pesticide Characteristics and Legislation

1. e, c, a, f, d, b
2. Domestic pesticides must be displayed separately from food and feed. Ex pesticides are a group of pesticides that are excluded from the regulatory requirements of the *Integrated Pest Management Act* Regulations. Secure containers sufficiently to prevent pesticides from spilling or escaping, and removed by an unauthorized person. Separate pesticides from other goo

contamination of human or animal food, clothes, household furnishings, and items.

3. Domestic pesticide products with a poison symbol on the label must be collected at collection depots for household hazardous waste. Other Domestic pesticide empty containers may be put in household garbage.
4. The store does not require a certified dispenser because aerosol sprays (including repellents) are Excluded pesticides.

Chapter 3. Pesticide Handling Guidelines

1. (c)
2. The area should be inspected regularly to look for damaged or leaking containers.
3. (c)
4. (b)
5. Leather gloves are not suitable and neither are dust masks. Leather will absorb pesticides and cannot be properly cleaned. Wearing contaminated gloves can result in pesticides being absorbed into the skin. A dust mask can protect the lungs from non-toxic dust, not from insecticide dusts, liquid mists or liquid sprays that produce toxic vapours.
6. (f)
7. (c)
8. Measuring spoons and cups should be used to measure pesticides, provided they are never used for cooking or eating utensils. They should be kept in the pesticide area.
9. (f)
10. Wind will blow the pesticide off target, giving poor results as well as risking contamination of non-target areas.
11. Food harvested before the minimum waiting period may contain unacceptable levels of pesticide residues. The days to harvest for each type of produce are listed on the pesticide label.
12. The greatest potential for environmental damage from pesticide use lies in harming non-target, living organisms, including pets and wildlife, fish, birds, and other organisms and desirable plants.
13. To reduce the risk of environmental damage when pesticides are required, the applicator should: minimize drift, prevent water contamination, prevent human poisoning, protect beneficial insects, and protect desirable plants.
14. (c)

Chapter 4. Equipment, Application, and Pesticide Use Calculations

1. Apply spray at a constant pressure and at a regular speed.
2. Any one of the following: ensure that the spreader is not clogged, walk at a walking speed, some spreaders should only be opened while being pushed.
3. Equipment must be checked to ensure it is working properly (not leaking) and must be cleaned before and after use to prevent corrosion and build-up of gummy pesticide residues.
4. It is hard to apply the pesticide at the correct rate.
5. Over-application of pesticides can: damage the area treated; damage or harm other non-target organisms; increase hazard to the applicator; produce residues on harvested produce; and cost the applicator more money.

6. A "broadcast treatment" is applied evenly over an entire area. A "spot tre applied to small, specific areas, such as individual plants or areas less th in size.

7. "Spray to drip" means that the spray droplets run together and start to d plants. "Spray to wet surface" means enough pesticide is applied to make damp to the touch, but not to cause the pesticide to run, drip, or puddle.

8. a) area - $12 \text{ ft} \times 18 \text{ ft} = 216 \text{ ft}^2$
b) conversion: $216 \text{ ft}^2 \times 0.093 = 20.08 \text{ m}^2$

$$9. \frac{? \text{ L}}{6 \text{ m}^2} = \frac{0.5 \text{ L}}{4 \text{ m}^2}$$

$$\frac{56 \text{ m}^2 \times 0.5}{4 \text{ m}^2} = 7 \text{ L}$$

$$10. \frac{15 \text{ ml}}{\text{L}} = \frac{? \text{ ml}}{7 \text{ L}}$$

$$(15 \text{ ml}) \times (7 \text{ L}) = 105 \text{ ml}$$

$$11. \frac{? \text{ ml}}{56 \text{ m}^2} = \frac{250 \text{ ml}}{100 \text{ m}^2}$$

$$\frac{56 \text{ m}^2 \times 250 \text{ m}}{100 \text{ m}^2} = 140 \text{ ml}$$

$$12. \frac{? \text{ kg}}{56 \text{ m}^2} = \frac{1.5 \text{ kg}}{100 \text{ m}^2}$$

$$\frac{56 \text{ m}^2 \times 1.5 \text{ kg}}{100 \text{ m}^2}$$

$$= 840 \text{ g or } .84 \text{ kg}$$

13. a) $105 \text{ ml of spray} \times 2 \text{ treatments/year} = 210 \text{ ml of spray}$
b) $140 \text{ ml of spray} \times 2 \text{ treatments/year} = 280 \text{ ml of spray}$
c) $840 \text{ g of granules} \times 2 \text{ treatments/year} = 1620 \text{ g of granules (1.62 kg)}$

14. a) $\frac{210 \text{ ml of spray}}{80 \text{ ml container}} = 2.63 \text{ containers (3 containers required)}$

b) $\frac{280 \text{ ml of spray}}{150 \text{ ml container}} = 1.87 \text{ containers (2 containers required)}$

c) $\frac{1680 \text{ g of granules}}{1000 \text{ g container}} = 1.68 \text{ containers (2 containers required)}$

$$15. \frac{15 \text{ ml}}{5 \text{ m}^2} = \frac{? \text{ ml}}{100 \text{ m}^2}$$

$$\frac{15 \text{ ml} \times 100 \text{ m}^2}{5 \text{ m}^2}$$

$$= 300 \text{ ml per } 100 \text{ m}^2$$

This means that the application rate is too high; the gardener can correct this fr compressed air sprayer by moving the sprayer more quickly (for example, walk decreasing the air pressure, or closing the nozzle opening.

Chapter 5. Emergency Response

1. (f)
 2. (c)
 3. The label may contain information on how to deal with a pesticide spill, a consulted before going ahead with a clean-up.
 4. (b)
 5. The basic first aid steps are: prevent additional contamination; check the breathing; get medical aid as soon as possible; and keep victim calm, wa comfortable.
 6. Pesticides can be released as vapours into the air or spread by water use fire.
 7. Safety preparations for fires: install a fire extinguisher for chemical fires; emergency numbers in the pesticide display area; and notify the fire dep. the vendor site contains pesticides.
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Chapter 6. Pesticide Use Reminders

1. List any two of the following common misconceptions customers have ab use: Pesticides are the best way to control pests. Pesticides only kill pest; pesticide is good, then more is better. Old products should be used at a f
 2. Using all-purpose products increases the amount of unnecessary pesticide released into the environment.
 3. RTUs are recommended over concentrates because they (list any three): hazardous than concentrated chemicals, do not require the user to calcul rates or have special measuring utensils, avoid the risk of spills during m long-term storage of hazardous concentrate, and can be disposed of in th rather than having to be taken to household hazardous waste depots.
 4. Using spot-sprays reduces the amount of pesticide required, which will: r health risks, minimize the risk of harming the environment, and save the money.
 5. Before using pesticides indoors, remove pets (including birds) and childre the area. Remove all food, dishes and utensils before kitchen cabinets ar indoor spraying, recommend a trigger pump sprayer or hand-held aeroso
 6. They need to know the life cycle of the insect pest in order to know when
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Chapter 7. Insecticides

1. a) *Bacillus thuringiensis* b) horticultural oil or insecticidal soap c) boric ac dioxide
 2. (b)
 3. (e)
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Chapter 8. Herbicides

1. Foliar herbicides are applied to plant foliage, not to the soil as are soil ste herbicides persist for 1-4 weeks; soil sterilants have a much longer persis 4 weeks to 12 months or more.

2. 2,4-D, dicamba and mecoprop are specific to broadleaf plants.
3. Any 3 of the following precautions: Do not use in vegetable gardens, flow around shrubs or ornamental plants, or on lawns. Mix concentrates only in water. AVOID DRIFT or accidental application to desirable plants. Do not apply if rainfall is forecast for the time of application.

Chapter 9. Fungicides

1. a.) Benomyl b.) Benomyl and triforine
2. Any three of the following: Do not apply when temperatures are 24°C or not combine with oil sprays. Do not apply within 30 days of dormant or sprays. Use only on plants listed on labels as tolerant to sulphur.

Chapter 10. Other Pesticides: Rodenticides and Molluscicides

1. Do not put bait stations in areas frequented by children or pets. Do not put bait stations in food storage, preparation or eating areas. Always wear gloves when handling rodenticides as they can be absorbed through the skin.
2. Protect dogs by using pelleted bait formulations only in bait stations, and away from treated areas.

Chapter 11. Household Pests

1. Removing and repairing wood damaged by water and ensuring no siding wood is in contact with soil.
2. Flea larvae take from 1-7 months to develop, then pupate to become adults. They can remain dormant for up to one year in carpets, then hatch into adults, if pets have been removed.
3. Poisoned rodents may die and decompose in inaccessible places, and the poisoning of pets and wild animals.

Chapter 12. Insects and Other Plant Pests

1. Adults emerge in early June, so start looking for them then.
2. Scale insects are round or oval waxy or shell like bumps (1-5 mm long) without wings.
3. Make traps by burying a shallow pan with lip flush to soil and place beer or grain in pan or use commercially available slug traps.

Chapter 13. Diseases of Plants

1. Plant resistant varieties.
 2. Leaves pucker and curl, developing reddish blisters early in the season, and leaves eventually turn powdery grey and drop.
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Chapter 14. Weeds and Vegetation

1. Mow lawns often to a height of 6-7 cm (leave quite long), fertilize with slow release fertilizers, maintain good pH, and water deep but infrequently.
2. Grow ground cover plants, apply a mulch of organic materials, or use lawn covered with mulch.

Chapter 15. Pest Animals

1. Use a motion activated water sprayer.