Agricultural Pest Control 1A Exam Study Guide

This study guide is intended to serve as an outline of the knowledge base covered by the *Agricultural Pest Control Category 1A Exam*. If you don't understand a term, concept, or statement, refer to the NM Pesticide Applicator Training Category 1A & 1B Manual for more information. This exam consists of 50 multiple choice, true/false and matching questions taken from the manual. Topics include:

1. General Ag Pest Knowledge
2. Common Ag Pests
3. Beneficial Insects
4. Insect, Mite and Invertebrate Control
5. Pathogen Control
6. Identification
7. Calculations

1. General Ag Pest Knowledge

a. Spiders and ticks belong to the class Arachnoidea.
b. Beetles and flies belong to the class Insecta.
c. All adult insects have 3 pairs of jointed legs and 3 body regions.
d. The exoskeleton of an insect is composed of a proteinaceous material called chitin.
e. Aphids have sucking mouthparts.
f. Lygus bugs have piercing-sucking mouthparts.
g. Complete metamorphosis consists of 4 life stages; egg, larva, pupa, adult.
h. Gradual metamorphosis consists of 3 life stages; egg, nymph, adult.
i. Incomplete metamorphosis consists of 3 life stages; egg, naiad, adult.
j. Grasshoppers exhibit gradual metamorphosis.

2. Common Ag Pests

a. The insect known as the corn earworm may also be known as the bollworm and the tomato fruitworm.
b. Greenbugs are a type of aphid.
c. The black, black margin and yellow aphids commonly attack pecans.
d. Some species of aphids attack virtually every crop in New Mexico.
e. Fleahoppers may affect cotton during its seedling stage but has its major effect around the time of squaring.
f. An infestation of mites can often be detected by the webbing of silk on the leaf surface.
g. The Banks grass mite, citrus flat mite and the two-spotted mite may all be found in small grains in New Mexico.
h. The alfalfa weevil is most damaging to alfalfa in the larval stage.
i. Stink bugs are serious pests of cotton, sorghum and alfalfa.
j. The pepper weevil is a severe pest of sweet and hot peppers.
k. The characteristic ragging of cotton leaves with large, blotchy holes and clean, sharp, non-necrotic margins is evidence of cabbage loopers.

3. Beneficial Insects

a. Many predatory and parasitic insects can hold or reduce populations of harmful insects to levels that do not require control.
b. Minute pirate bugs, assassin bugs and syrphid flies are examples of beneficial insects.
c. Assassin bugs do not restrict their prey to a few species, but will feed on most prey species they encounter.
d. Big-eyed bugs may be confused with immature stink bugs.
e. Lady beetles are among the most efficient known predators of aphids and mites.
f. Nabids are effective predators of aphids, leafhoppers, and lygus bugs.

4. Insect, Mite and Invertebrate Control

a. The best time to apply an insecticide is when the pest population has reached the economic threshold.
b. To be effective, a pesticide must penetrate the pest organism, move or be transported to the site of action, and disrupt or alter a vital function.
c. When selecting an insecticide, you should consider the target pest, the number of beneficial insects present, and the kind of crop you will be spraying.
d. Insecticides which must be eaten by the insect in order to be effective are called stomach poisons.
e. Bacillus thuringiensis (Bt) is the an example of a biological insecticide.
f. Pyrethroids are derived from the naturally occurring insecticide pyrethrum.
g. Insecticide resistance develops by selective breeding from survivors of pesticide treatments.
h. Generally speaking, insecticides are the most toxic to humans.
i. Disruption of the ecosystem by pesticide spraying may show up as chronic effects of aquatic organisms, reduction of beneficial insects and mortality in fish and birds.
j. Volatilization from surfaces may be responsible for the loss of large amounts of some pesticides in the air.

5. Pathogen Control

a. The most common plant diseases that can result in economic loss in the Southwest are caused by soil-borne diseases.
b. Verticillium wilt is caused by a soil-borne fungus.
c. Curly top disease of vegetables is caused by a virus injected into plants by the sugarbeet leafhopper.
d. Fungi are the largest group of plant pathogens.
e. Powdery mildew is a fungus.
f. Phymatotrichum or Texas root rot is a common disease on cotton, alfalfa and grapes.
g. Nematodes are microscopic worms.
h. Leaf spot, wilt or mosaic are examples of symptoms of plant diseases; mycelia or sclerotia are examples of signs of plant disease.
i. *Synergism* occurs when the combined action of two pesticides is greater than the sum of their individual actions.
j. The most effective, simple and economical means of controlling plant disease is usually provided by using disease-resistant varieties.

6. Identification

Be able to identify (from pictures) the following pests.

a. Alfalfa Weevil
b. Stink Bug
c. Two-spotted Spider Mite
d. Corn Earworm
e. Cabbage Looper
f. Pink Bollworm
g. Pepper Weevil
h. Aphid
i. Leafhopper

7. Calculations

a. Be able to determine the total pounds of a certain pesticide formulation required to treat a field when given the field size, the pesticide formulation percentage and the label required amount of active ingredient.
b. Be able to determine the amount of pesticide required for one swath of a field when given the field dimensions and the application rate per acre.