



Agriculture and
Agri-Food Canada

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Management of Grape Pests

Tom Lowery
AAFC-SuRDC



Step 1: Acquisition of information

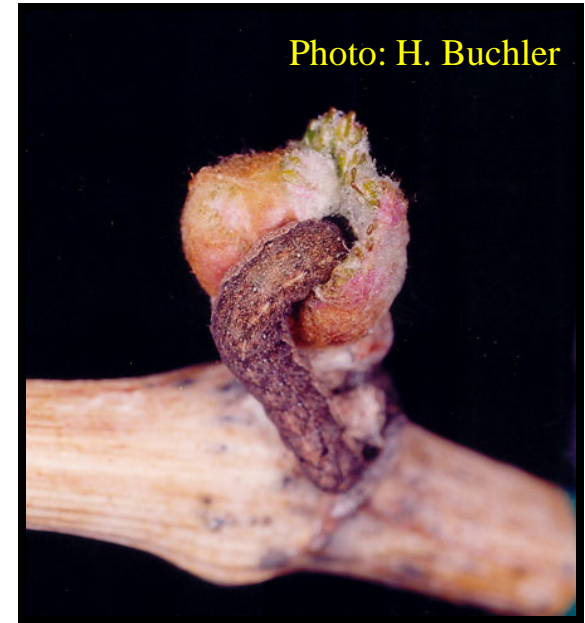
Which grape pests do I have?

Best Practices Guide for Grapes for BC.

Photo Guide to the Insect and Mite Pests of Grapes in BC.

Photo Guide to Beneficial Insects and Mites in BC Vineyards.

Other sources, particularly from WA.



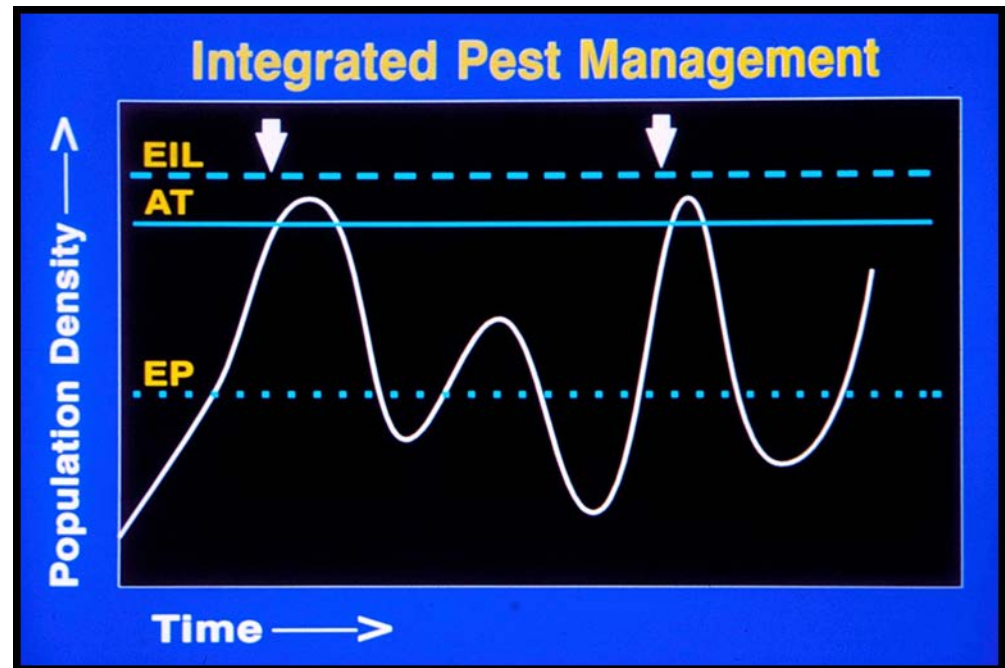
Major pests include leafhoppers, climbing cutworm, grape phylloxera, wasps, mealybug and soft scale.

Secondary pests include spider mites, grape leaf rust mite, thrips.

Step 2: Are they causing economic losses? Yearly?

Understand economic thresholds.

Damage to grapes only occurs when pest populations reach certain levels. Economic thresholds consider the cost of control, including possible sprays for secondary pests.



A threshold for leafhoppers of 20-25 nymphs per leaf will result in a moderate amount of leaf stippling.



Severe leafhopper feeding damage to grapevines



Virginia creeper leafhopper



Western grape leafhopper

Economic thresholds can change

Grape mealybug, *Pseudococcus maritimus*, was previously considered a minor pest of wine grapes causing little or no economic loss.

Now known to vector Grapevine leafroll associated virus 3, it is considered a serious pest of grapes.



Photo by H. Buchler

Step 3: What is the best method of control?

Insecticides are often the first consideration, but they should be used sparingly and with care. There are many considerations.

Which material is the safest to use and most effective?

What effect does it have on non-target and beneficial insects?

Does it cause secondary pest outbreaks?

Grape leaf rust mite damage





Integrated Pest Management (IPM)

- Involves the integrated application of complimentary pest control strategies.
- Primarily involves pest monitoring, targeted insecticide use, new application technologies, prevention of insecticide resistance, and increased economic return to producers.
- Focused largely on the health of the plant or animal and reduced residues in finished product.



Step 4: Monitor, record and map pest numbers and damage.

Visual inspections for pests or damage; trapping; counts of pests and beneficials on various parts of the vine at appropriate times of the year.

e.g. adult scale on the vine trunk during pruning operations.

Accurate records and maps should be maintained that include comments on actions taken, effectiveness of treatment, resulting damage, response of secondary pests, effects on beneficial insects, etc..



Damage from certain pests often occurs in the same location each year and it might be sufficient to treat only a small portion of the vineyard.

Some varieties are less susceptible or less preferred by pests.


Records and maps might indicate outbreaks of secondary pests associated with the use of certain spray materials, or in the case of leafhoppers that certain sprays deter them.

Step 5: Consider using management tactics other than pesticides first.

Properly balanced vine nutrition; early season leaf removal for leafhopper (and disease) control; beneficial groundcover plant species and mixes; etc.

Increased diversity of groundcover plants offers other benefits, such as increased numbers of beneficial insects.



The background of the slide features a warm, golden-orange color palette. On the left, a large, soft-edged sun is partially visible. To the right, several wheat stalks with golden grains are shown, some in sharp focus and others blurred, creating a sense of depth. The overall composition is bright and agricultural.

Sprays of certain fungicides, particularly sulphur and the new strobilurins, can have an effect on pest populations.

Low to moderate rates of sulphur applied early in the season are effective for the control of grape erineum mite. Higher rates have a negative impact on predacious mites and thrips.

Step 6. Select appropriate insecticides.

Consider selectivity, persistence, safety, etc.

Apply chemicals at the proper rates and spray volumes, and only where required.

Maintain accurate spray records, note effectiveness and other outcomes.



Anagrus daanei emerging from a leafhopper egg.

Consult the Pest Control Products Recommended for use on Grapes in British Columbia.



All insecticides have positive and negative attributes.

e.g. *Bacillus thuringiensis*

+ve: very selective, low mammalian toxicity, non-persistent, preserves beneficial insects, etc..

-ve: expensive, less effective, must be consumed, etc.

e.g. Assail

+ve: somewhat selective, effective, systemic, etc..

-ve: persistent, hard on key beneficials, repellent to leafhoppers, etc.



Some Least Toxic Pesticides

- Microbials – *B.t.*, spinosad (Entrust)
- Physical controls – soap, clay (Surround), oil.
- Tetrionic acids – Movento.
- Anthanilic amides – Altacor.



Considerations:

Pyrethroids (permethrin, cypermethrin) – broad spectrum.

Assail – repellent, persistent, possible mite outbreaks.

OPs (Guthion, etc.) – restricted use, high mammalian toxicity,
broad spectrum of activity.

Sulphur (Kumulus) – high rates suppress predatory mites.

Spinosad (Success) – suppresses beneficial thrips.



Pesticide use can be reduced using an appropriate IPM program requiring:

- knowledge of grape pests and beneficial insects
- a monitoring, recording, and mapping system
- an understanding of economic damage levels
- use of non-chemical controls
- selection of the most appropriate spray materials
- applying sprays properly at the correct place and time

Thank You !

