Managing Common Vineyard Pests Using IPM

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UC Cooperative Extension IPM Advisor
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Overview

Goal: Provide a framework for managing any pest

Using IPM in Vineyards
Pyramid, examples, and tools

Grape Leaf Skeletonizer

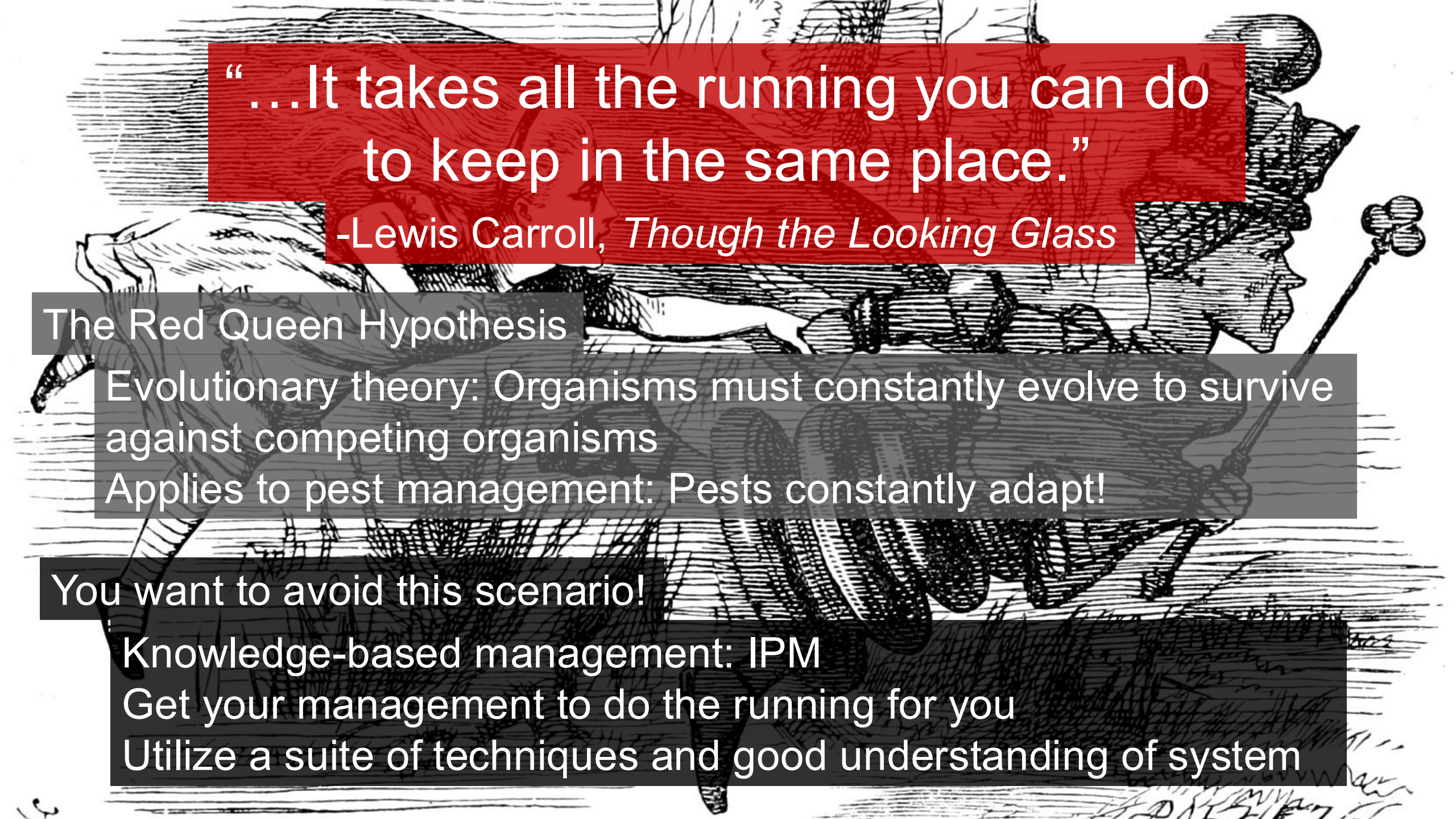
Other Caterpillars

Leadcable and Branch and Twig Borers

False Chinch Bug

IPM Example with Unknown Pest

Where to find more info



"…It takes all the running you can do to keep in the same place."

-Lewis Carroll, *Though the Looking Glass*

The Red Queen Hypothesis

Evolutionary theory: Organisms must constantly evolve to survive against competing organisms

Applies to pest management: Pests constantly adapt!

You want to avoid this scenario!

Knowledge-based management: IPM

Get your management to do the running for you

Utilize a suite of techniques and good understanding of system

IPM Pyramid

Size=Amount of Effort/Time

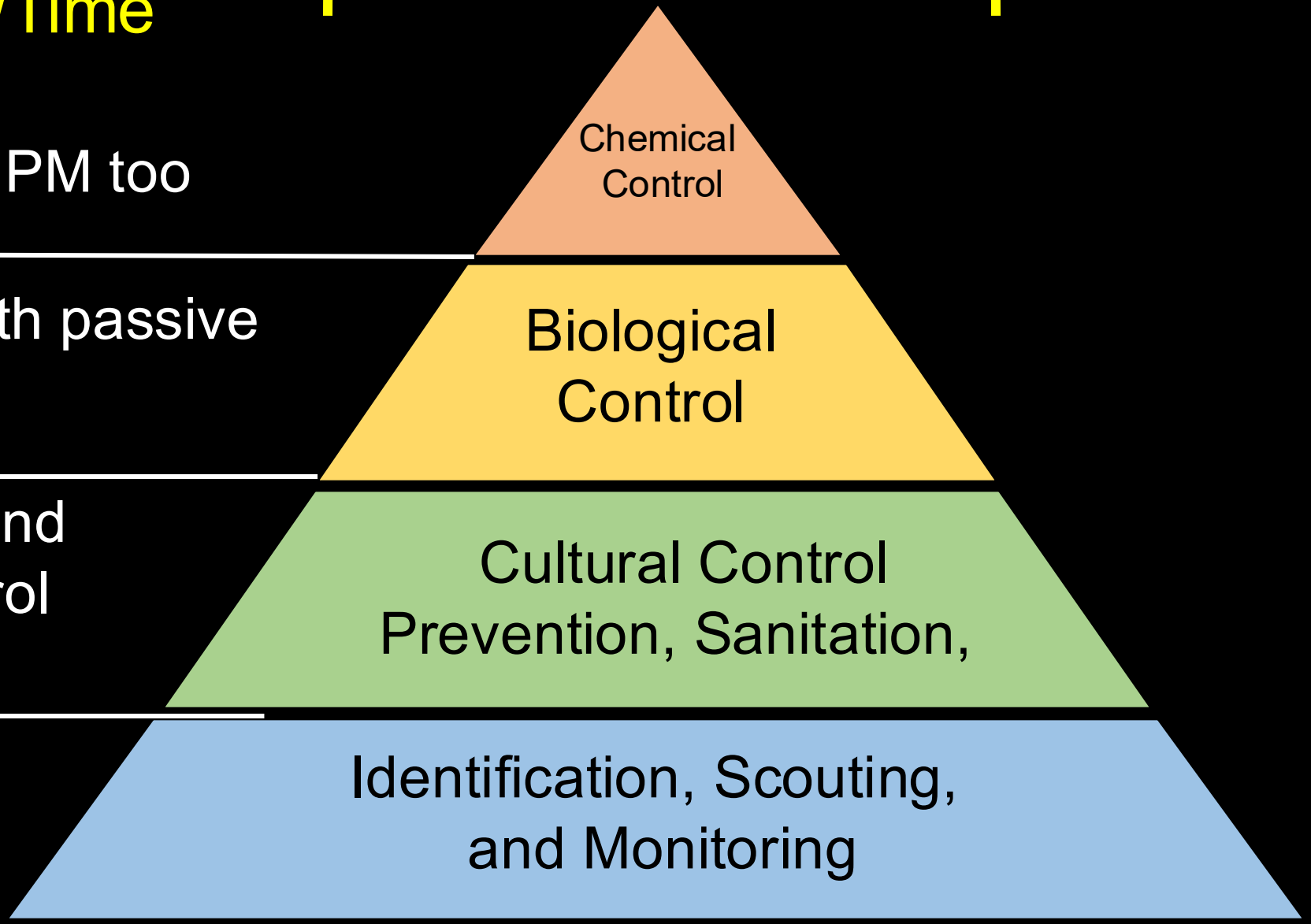
Shift Your Perspective

Pesticides are a part of IPM too

Beneficial organisms, both passive and active

Preventative measures and basic, but powerful, control options

Know your pests and when they are present



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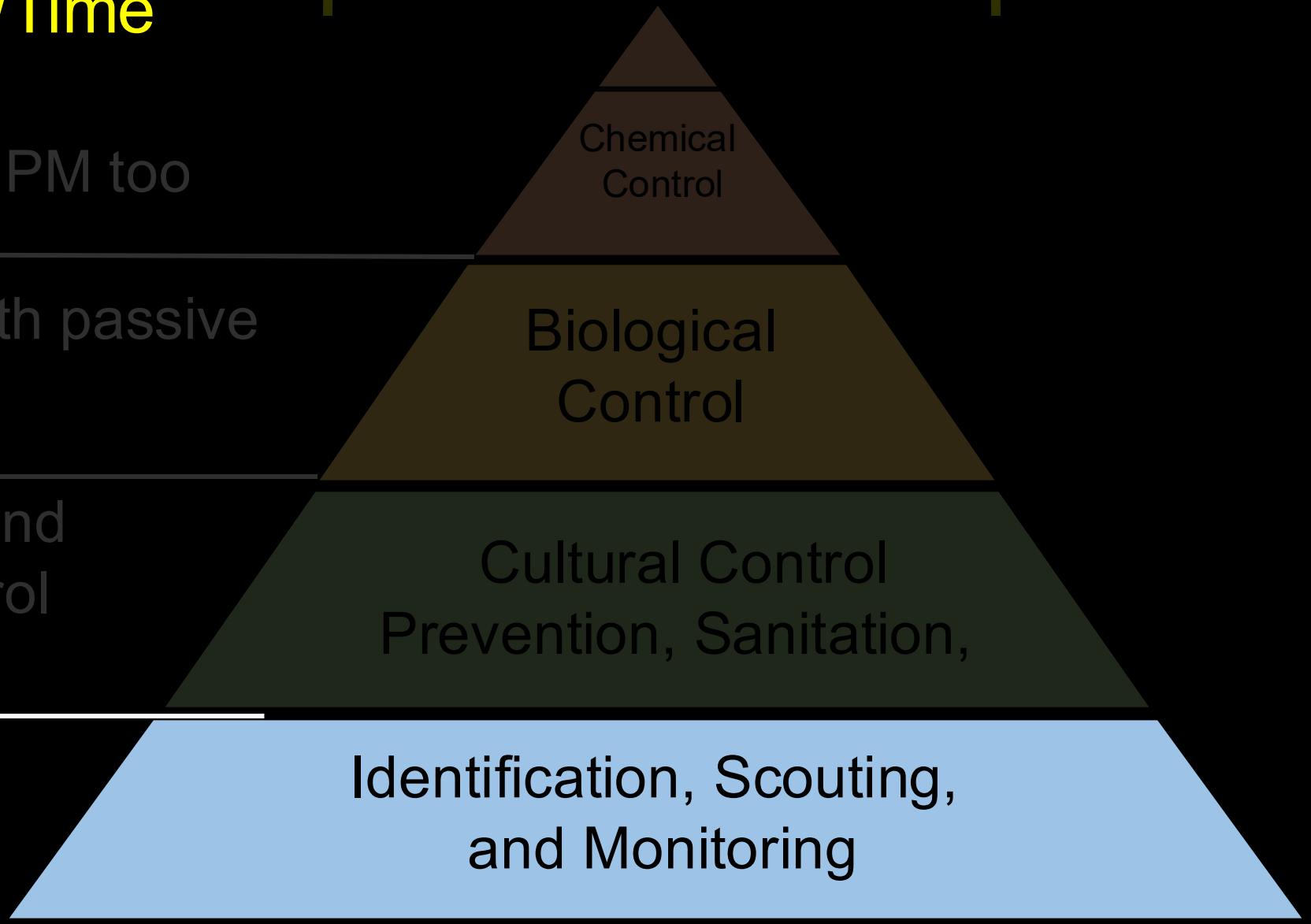

Pest Identification

If you don't know what is causing the problem…

…It is much harder to manage

Could apply ineffective treatment, harm beneficials

Sucking Insects

Dying patches, distorted tissue

Sooty mold/whitewash

Sharpshooters, Mealybugs, aphids, whiteflies

Chewing Insects

Holes in leaves, hollowed out sections, bored vines

Caterpillars, beetles, grubs

Mites/Thrips

Dying patches, distorted tissue

Spider mites, thrips

Scopes for Pest ID

How do you identify, take pictures of pests?
Relatively cheap magnifiers available

Inexpensive and accessible options:

Hand Lens

$5-$10. Keep it with you

Phone Camera Scope

$20-$40. Clip onto phone

Handheld Digital Scope

~$200 for decent model
Connects to computer

Scouting and Monitoring

Check your plants, see if pests are present, keep notes

Grape example

- Divide the vineyard into quadrants.
- Randomly select 5 vines (few vines in from the end of the row)
- Look for pests, damage, other signs on each of the 20 vines.

Keep track of trends

- Pests uniformly distributed, patchy?
- Also search for beneficial insects

Can use traps as well!

Do this regularly (weekly ideal)

Saves time and money later, crucial to effective pest management

Scout again after management: see if it worked!

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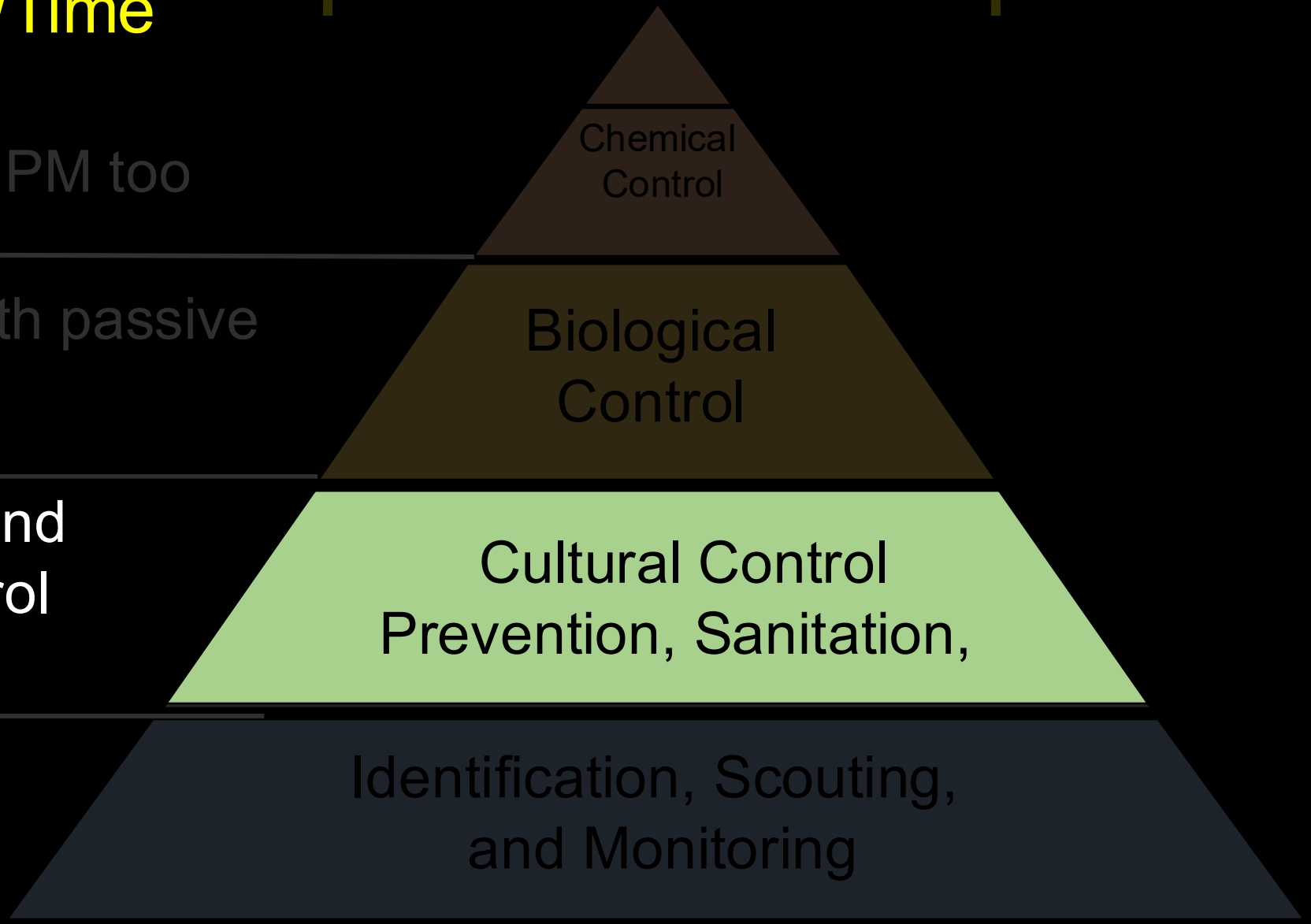

Cultural Control, Prevention, Sanitation

Extremely important baseline management

Often has largest impact on pests, can prevent problems

Ex: vineyard sanitation key for almost all pests

Rogue diseased, badly damaged plants (Pierce's disease)

Remove debris, dead vines, old grape clusters

Get rid of various weeds that harbor pests

Sharpshooters, false chinch bug

Remove pests by hand if feasible in your operation

Pheromone traps, sticky cards for mass trapping, disruption

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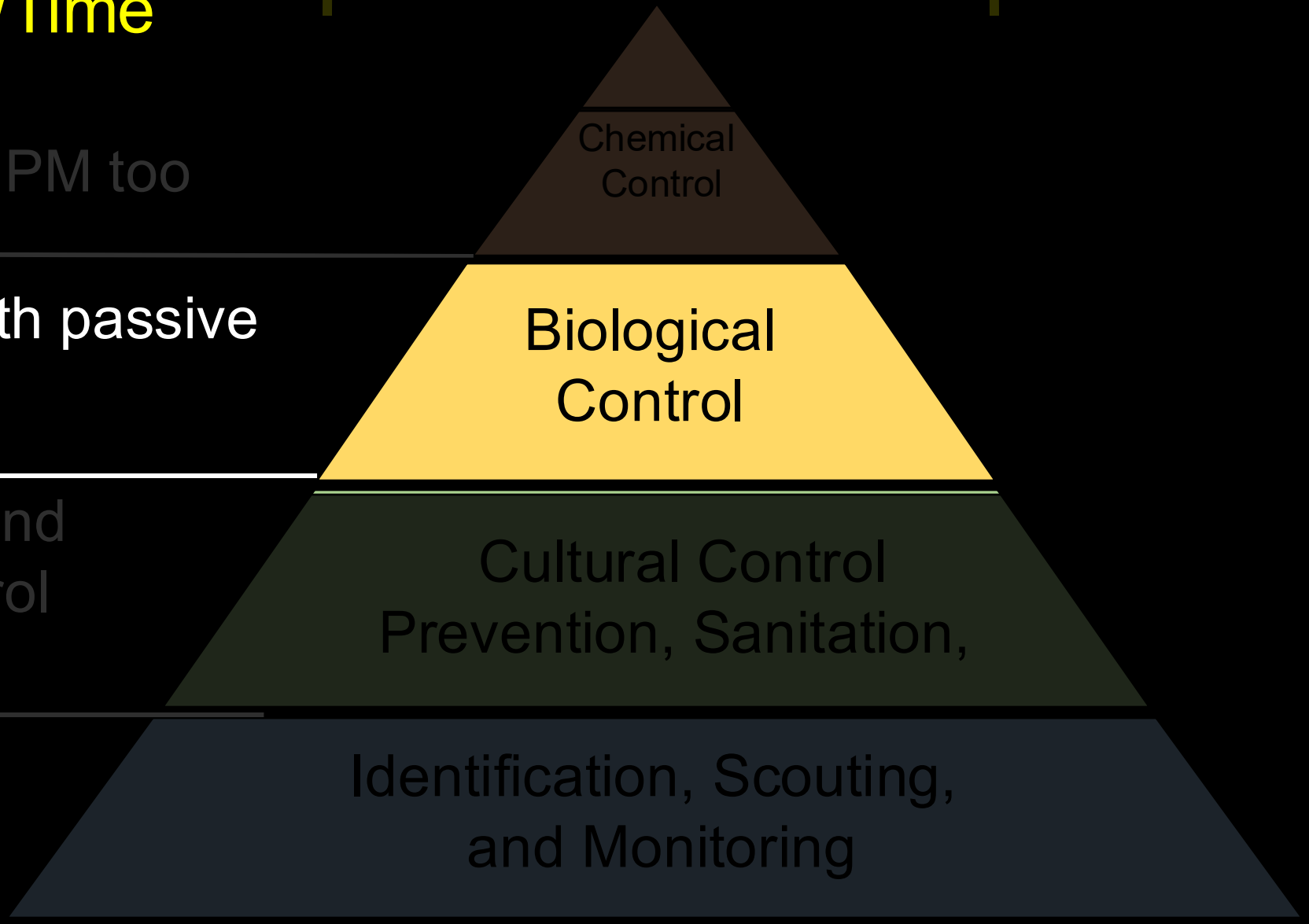

Biological Control

Many different ways to use living organisms

Conservation Biological Control

Create situation so predators, parasitoids are present, move into vines

Wildflower plantings, cover crops, mulching

Pathogens

Use much like normal pesticides. Very effective

Bt, nematodes, fungi

Buy and release predators

Can be tricky, expensive

Ex: mealybug destroyers, predatory mites

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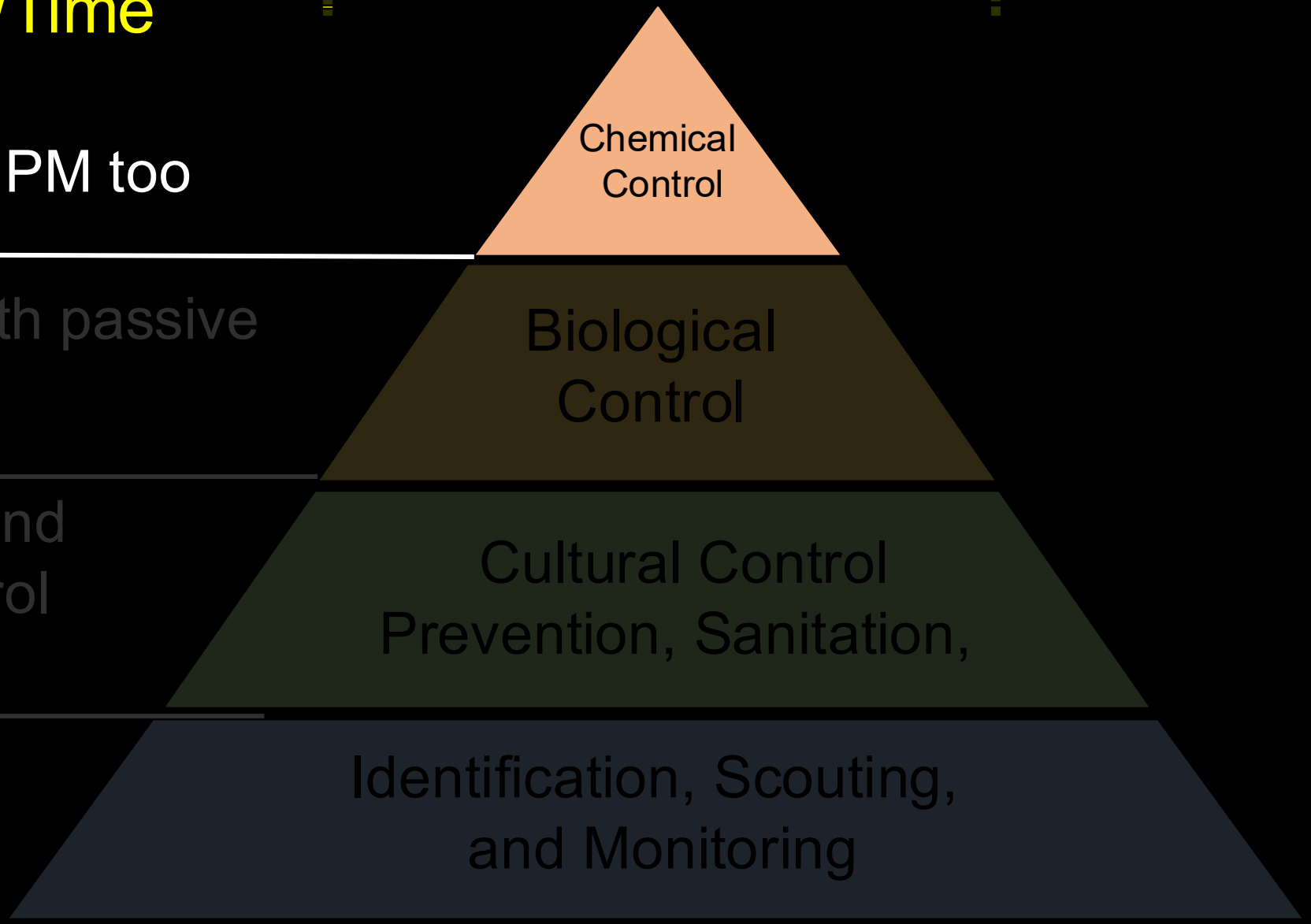

Judiciously Use Chemical Control

Pesticides are definitely part of IPM

Just not the first or only tool to use

Pesticides can be combined with other options

Relative toxicity of insecticides to natural enemies.

	TOXICITY TO PARASITES AND PREDATORS[1]	
INSECTICIDE	**Direct**	**Residual**
microbial (*Bacillus thuringiensis*)	no	no
botanicals (pyrethrins)	yes/no[2]	no
oil (horticultural), soap (potash soap)	yes	no
microbial (spinosad)	yes/no[2]	yes/no[2]
neonicotinoids (imidacloprid)	yes/no[2]	yes
carbamates (carbaryl*), organophosphates (malathion), pyrethroids (bifenthrin)	yes	yes

Timing is key

Spinosad (Entrust)

Harmful to some beneficials

Requires good knowledge of system, interactions

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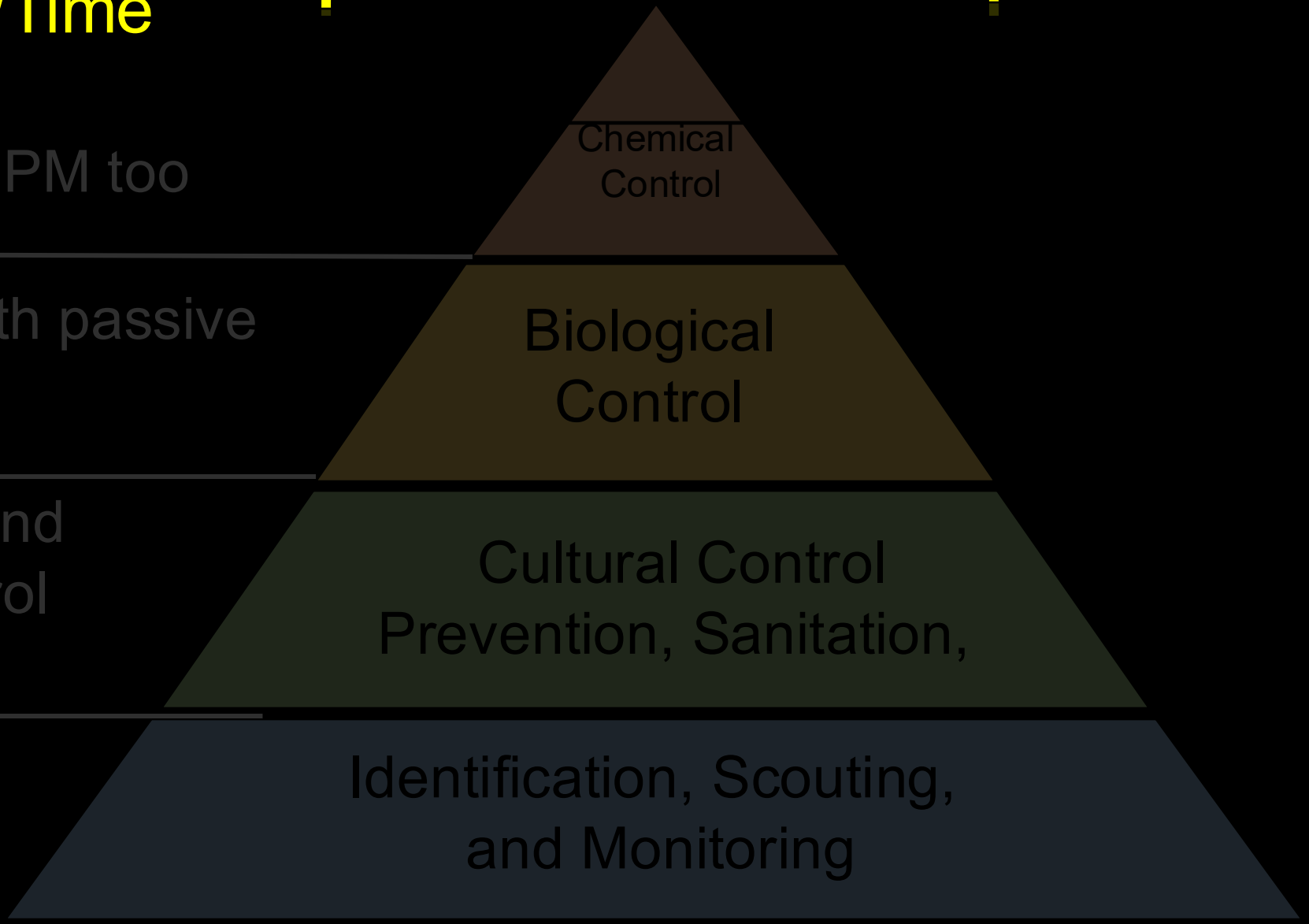


Shift Your Perspective

Many growers frequently live in Red Queen Scenario

Constantly running to maintain the status quo

Consider changing your expectations

“What am I trying to achieve and why?”

Accept some damage, some “disorder”

Don’t treat just because you see a pest

Know what counts as intolerable damage

Fundamentally, this is important to sustainable IPM

IPM Summary

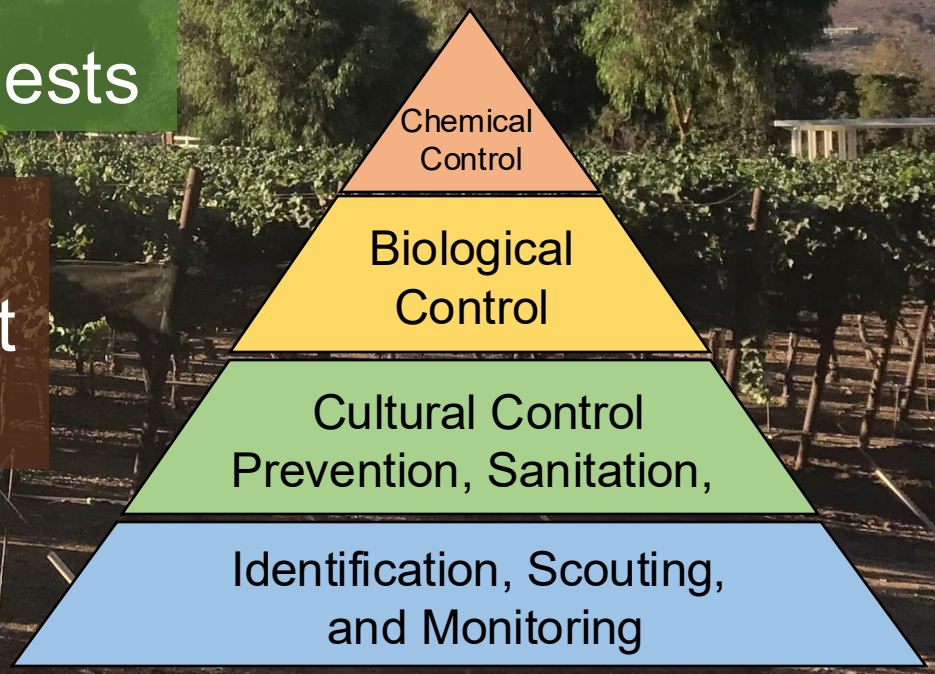
Avoid Red Queen Scenario (as much as possible)
Use variety of techniques together

Scouting and Monitoring are Key
Consistency, keep track of trends, monitor again after treatment

Cultural Control and Sanitation
Almost always a main way to manage pests

Biological Control Good Option
Usually reduces impact of management
Chemical Control also part of IPM

Adjust Expectations as Possible



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Western Grape Leaf Skeletonizer

Abbreviated WGLS

Harrisina brillians

- Adults dark, metallic
- Larvae yellow with purple bands

Young larvae feed on underside of leaves

- Mature larvae skeletonize leaves
- Larvae have irritating hairs
- Defoliation, sunburn, damage to clusters

Granulosis virus here in Southern CA fatal to WGLS

- Fewer eggs laid, larvae feed less
- Tend to wander, are sluggish, leaves liquid trails
- Most die before pupating into adults
- Those that survive can transmit to next generation

Eggs scattered instead of neat and even

Larvae disorganized in feeding rather than in line

Mature larvae different sizes instead of even

Western Grape Leaf Skeletonizer (WGLS)

More outbreaks of WGLS recently
Appears that virus not keeping them as suppressed

Could be new introduced WGLS populations, or developing resistance

Monitor for larvae, especially around border
- Adults are not great fliers, often stop at border
- Pheromone traps available

If larvae present, check for signs of virus

Bt and cryocide used against younger larvae

Success, Assail, Provado affect all larval lifestages
- Assail and Provado also used against sharpshooters

Other Caterpillars

Leafrollers and leaf folders
- Omnivorous leafroller, orange tortrix
- Small-medium caterpillars
- Often use silk to roll leaves together

Feed on leaves, fruit
- Direct damage and secondary infection

Monitor early, especially if present previously
- Pheromone traps for adults
- Sanitize vineyard of weeds, old clusters
- Can be present in oats/barley cover crops
- 1 larva per vine, likely treat

Spinosad, cryolite, Bt also usually effective

Altacor, insect growth regulator Intrepid

Borers (Leadcable, Branch and Twig)

Leadcable borer: *Scobicia declivis*

- Pin hole exits. Damages vines
- Frass-filled tunnels

Branch and Twig Borer: *Meglalus confertus*

- Larger, bigger galleries
- Can kill plants
- Leaves sawdust behind

Scouting and Sanitation

- Check for damage
- Remove infested wood, shred bush
- Larvae can live, pupate in dead wood
- Drip nematodes (Steinernema carpocapsae) into holes

False Chinch Bugs

Sporadic pest, but can be a serious problem
- Feed on variety of weeds in grassy areas
- As weeds die, can migrate into vineyards

Inject toxins as they feed
- Adults and nymphs feed on plants
- Can cause vines to wilt, turn brown

More weeds/wetter year=more false chinch bugs

Weed removal at correct time
- Disc under large weedy sections
  - Few weeks before budbreak
- Be careful if later: big influx of bugs!

If necessary, spot treat with fenpropathrin (not great)
- 30in bands on ground can prevent migration

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Unknown Pest

First steps?

What is it and is it causing much damage?

What is it likely to be?

Chewing pest, likely caterpillar

Caterpillar on 1-2 vines, minor defoliation
Salt Marsh Caterpillar
What now?

Remove by hand, monitor situation

Spinosad, Bt, maybe cryolite
Probably not worth treating (beyond spot treatment)
Minor, sporadic pest

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Learn More

UCIPM Website

https://ipm.ucanr.edu/

Info on pests/management

Applies to many crops

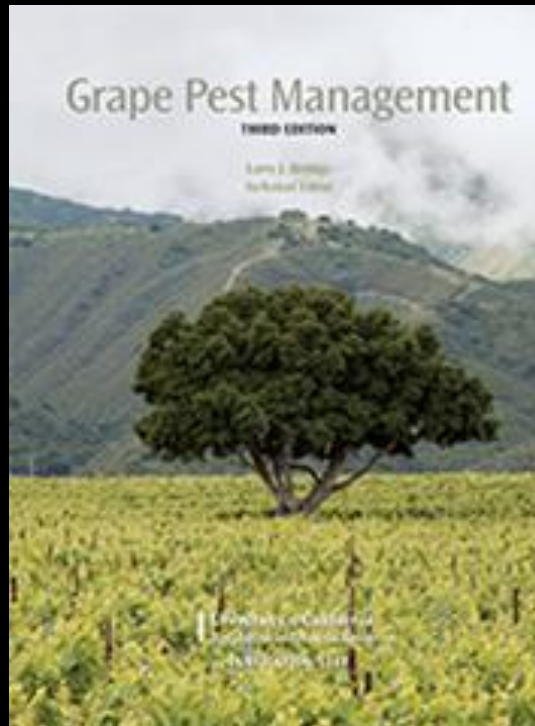
Has scouting plans, lists of insecticides, options for organic, etc.

Page on grape links to in-depth info on many pests

Be Aware: 2 sections. One for Ag, one for home gardens

Grape Pest Management book

Available from UCANR ($40)



Feel free to contact me with questions, for site visits, etc.

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