

LACEWING

1. C. carnea is not effective as a predator of LH because it prefers to stay in weeds and other low-growing crops. This is the species typically reared and sold.
2. The native species, C. commanche, appears to have the potential of being very effective.
3. Lacewings from insectaries are poor performers vs. wild counterparts due to loss of vigor from in-breeding. There is 50% mortality of eggs applied in the field.
4. The use of lacewing feeding attractants to attract the native species appears to have tremendous potential.

PARASITES OF OLR

1. There are serious and unanswered questions regarding:
 - A) The viability and host preference of the Trichogramma spp. being released,
 - B) The number necessary for release per Acre to have a consistent and significant impact on OLR, and
 - C) The timing(s) for the releases for optimum impact on OLR.

IMPROVED SOIL HEALTH

SOIL-APPLIED PRODUCTS

1. Microbial-stimulating products.
2. Humic acid/humate products.
3. Dry manures/compost products.
4. Liquid chicken manure products.
5. Winter/summer cover crops.

SOIL HEALTH = PLANT HEALTH

OVERALL STRATEGY

1. Create and encourage BIODIVERSITY in your vineyards with summer insectary cover crops.
2. Improve the SOIL HEALTH in your vineyards.
3. Monitor closely both bad and good bugs.
4. Incorporate leaf-pulling in your cultural practices as much as is economically feasible.
5. Use materials "soft" on this biodiverse system, e.g. soaps, oils, botanicals, low rates of Omite, Vendex, rather than materials "hard" on this system.
6. Consider inundative releases of predaceous mites in chronic mite hot spots.

PREDATOR RELEASES

1. PREDACEOUS MITES
2. LACEWING
3. PARASITES FOR OLR

PREDACEOUS MITES

1. Effective release rate of *M. occidentalis* for immediate impact is 30,000 per Acre at a cost of \$300 to \$350 per Acre.
2. Release rates of 5,000 per Acre per Year may be effective over time when combined with other "soft" strategies.
3. Method of releasing is critical. Clearly the most effective method of releasing the mites is placing whole or parts of bean plants on the vine.
4. The source of the predator mites is critical. All predator mites are not created equal.

LEAF-PULLING

1. Pull basal 3 or 4 leaves.
2. Significant impact on the incidence and severity of bunch rot.
3. May significantly impact LH and mite populations, particularly if the timing of the leaf-pulling is optimal.
4. Expensive.

BOTANICAL PESTICIDES

1. PYRENONE (Pyrethrins + PB)
2. PYRELLIN EC (Pyrethrins + Rotenone)
3. PYROCIDE (Pyrethrins + PB + MGK264)

CRITICAL FACTORS IN THEIR USE:

1. COVERAGE - Must spray every row, 50-75 gpa, nozzled for maximum underleaf coverage.
2. TIMING FOR LH - Works best on 1st to 3rd instar stages of LH but will kill 4th and 5th instars with full coverage.
3. TIME OF DAY - Evening applications work best.
4. DEPOSITION-ENHANCING ADJUVANTS - May improve performance, particularly one with a UV absorber.

BOTANICALS

- Effective against all instars of LH, particularly 1st through 3rd.
- No activity against mites but will kill predaceous mites.

TREATMENT	Willamette mite motiles/leaf		
	Pretreatment	6 DAT	13 DAT
SUPER INSECTICIDAL SOAP @ 1 qt/Ac.	3.1	4.0	11.8
SUPER INSECTICIDAL SOAP @ 2 qts/Ac.	7.1	11.8	-
M-PEDE @ 2%	6.7	30.9	-
CONTROL	3.2	51.2	59.1
SAF-T-SIDE OIL @ 2%	2.8	2.8	24.2
SUPER SUFFOCANT OIL @ 0.5%	2.6	4.0	7.8

SUMMER OILS

1. SAF-T-SIDE OIL (registered for use in CA)
2. SUPER SUFFOCANT OIL (currently being registered in CA)

CRITICAL FACTORS IN THEIR USE:

1. COVERAGE - Must spray every row, 50-75 gpa, nozzled for maximum underleaf coverage.
2. TIMING - Not critical for mite control but may be for LH control.
3. PHYTOTOXICITY - Does not appear to be a problem.

OILS

- Effective against mite motiles and eggs.
- Effective against LH nymphs ?

INSECTICIDAL SOAPS

1. M-PEDE (registered for use in CA)
2. SUPER INSECTICIDAL SOAP (currently being registered in CA)

CRITICAL FACTORS IN THEIR USE:

1. COVERAGE - Must spray every row, 50-75 gpa, nozzled for maximum underleaf coverage.
2. TIMING FOR LH - Must spray when LH nymphs are in 1st to 3rd instar stages.
3. TIME OF DAY - Evening applications work best.
4. DEPOSITION-ENHANCING ADJUVANTS - These appear to improve performance of soaps by improving deposition.

M-PEDE

- Effective against early instar LH nymphs.
- Only suppressive against mite motiles.
- Appears to have little effect on LH or mite eggs.

SUPER INSECT. SOAP

- Appears to be effective against LH nymphs and mite motiles.
- Appears to have little effect on LH or mite eggs.

SUMMER COVER CROPS

1. Several types of insectary mixes and sources for the mixes.
2. Feasible for all types of irrigation systems.
3. Objective is to create and encourage:

BIODIVERSITY

FIELD-PROVEN CONTROL STRATEGIES

SUMMER COVER CROPS

INSECTICIDAL SOAPS

SUMMER OILS

BOTANICAL PESTICIDES

LEAF-PULLING

PREDATOR RELEASES

IMPROVE SOIL HEALTH

EXPERIMENTAL CONTROL STRATEGIES

LACEWING FEEDING ATTRACTANTS

WILLAMETTE MITE RELEASES

SOIL MICROBES AND COMPOUND 422

NEW ORGANIC PEST CONTROL SPRAY