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Leafroll in Commercial Vineyards in New York

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Leafroll and Red Blotch Workshop
Jan. 21, 2014, Niagara-on-the-Lake, ON

Leafroll Disease

- Widespread distribution
68%, 65 of 95 vineyard blocks surveyed
- High incidence (>20%)
56%, 46 of 65 vineyard blocks surveyed
- Prevalence
 - GLRaV-3 (15%) >> GLRaV-1 (10%) > GLRaV-2 (3%) ~ mixed (4%)



Lemberger





Leafroll Disease

- Mealybugs and soft scales
 - ✓ 81%, 25 of 31 vineyard blocks surveyed
 - ✓ Very low population densities:
 - 0.00-0.62 scales/min
 - 0.00-0.54 mealybugs/min



Grape mealybug



Brown scale



Cottony maple scale



Leafroll Disease

- Most mealybugs and soft scales (55%, 54 of 99) in diseased vineyard are viruliferous
- Viruliferous insects are present from April to September
- Mealybug crawlers can transmit viruses as early as budswell/budbreak
- Virus spread within a limited number of vineyards



Economic Analysis

- Cost impact in absence of response:
 - \$25,407/ha (30% yield reduction, no quality penalty)
 - \$41,019/ha (50% yield reduction and 10% penalty for poor quality)



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 - \$3,208-\$25,007 per acre (1-27% infection levels) after roguing
 - \$24,654 per acre (>27% infection levels) after vineyard replacement

Atallah *et al.* Am. J. Enol. Vitic. (2012)



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- **Cost impact for planting certified vines**
 - \$1,829/ha, assuming a price markup of 25% for certified vines derived from clean, virus-tested stocks

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Decision Matrices for Management

	No penalty	10% penalty
< 30% yield loss		
< 25% infection	ROGUE	ROGUE
> 25% infection	DO NOTHING	REPLACE
30% yield loss		
< 25% infection	ROGUE	ROGUE
> 25% infection	DO NOTHING	REPLACE
50% yield loss		
< 25% infection	ROGUE	ROGUE
> 25% infection	REPLACE	REPLACE

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Conclusions

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 - ✓ Poor sanitary quality of planting material



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- Uptake of GLRaV-1 and/or -3 by vectors
 - ✓ Acquisition as early as budswell
 - ✓ Transmission potential within but not so much between vineyard blocks



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 - ✓ Poor sanitary quality of planting material
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- Uptake of GLRaV-1 and/or -3 by vectors
 - ✓ Acquisition as early as budswell
 - ✓ Transmission potential within but not so much between vineyard blocks
- Spread of GLRaV-1 and GLRaV-3 in some vineyards



Conclusions

- Management recommendations
 - ✓ Carefully select planting material
 - ✓ Monitor, flag and rogue if incidence $<25\%$ (± 2)
 - ✓ Monitor and replace if incidence $>25\%$



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Cabernet franc



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Cabernet Sauvignon



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Thanks