



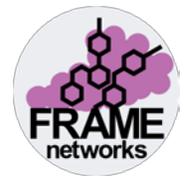
Evaluating Spray Programs Activity – Scenario Worksheet



Program Notes (rates, intervals, timing)	Key Weather Conditions	Spray Coverage Notes	Final Review / Recommendation
<p>Scenario 1</p> <p>Intervals and timing seemed appropriate for the disease pressure. Intervals were, on average, between 10 and 14 days throughout the season, depending on contact vs. synthetic product use. Timing appeared to align appropriately with phenology.</p>	<p>Cooler, wetter growing season – higher disease pressure</p>	<p>Appears to be excess water on the spray cards. Might be indicative that the spray cards were left outside during damp conditions or could be an indication that <i>too much</i> spray was used, or the sprayer is not properly calibrated, resulting in spray run-off. Run-off is a form of drift, which might result in less active ingredient on the vine for mildew protection.</p>	<p>In this scenario, there are likely 2 main reasons for lack of disease control. First, the excessive run-off as indicated by the color of the spray cards, could mean that product is not staying on the plant – it is moving off the leaves and onto the ground. That would result in insufficient product staying where it needs to be. If that is a routine problem in this vineyard, it could mean that below-label rates are commonly applied, which could be a starting point for the development of fungicide resistance. The second reason could be related to fungicide resistance. Given the season was high-pressure, and that at-risk fungicide was used during bloom without a tank mix with a contact product, could also indicate that there might be a problem with fungicide resistance in the vineyard.</p> <p>For this situation, we recommend the vineyard get tested for potential FRAC 11 fungicide resistance and focus on recalibrating their sprayer and adjust spray volume to not have run-off.</p>
<p>Scenario 2</p> <p>Intervals appear to be stretched in the pre-bloom through bloom season. There is a 21-day interval in mid-May, followed by a 15 day interval in June, and followed with another 21 day interval into July. These are very stretched intervals given the weather conditions.</p>	<p>Cooler, wetter growing season – higher disease pressure</p>	<p>Coverage is un-even. Little to no droplets seen in the fruit zone, good spray coverage in the canopy. This could mean that in the process of spraying, fruit was not getting adequate coverage, and thus, may not have been protected from powdery mildew infection.</p>	<p>This scenario also has likely two main reasons for lack of disease control. First, is the uneven coverage as seen on the spray cards. The upper canopy appears to have good coverage, while the fruit zone is having less-than-ideal coverage. This may have resulted in visibly good disease control on the canopy, while the fruit was unprotected (and likely, harder to see that an outbreak was building up). The second reason is likely related to stretched application intervals. One might think that fungicide resistance is an issue, given the use of a FRAC 11-containing fungicide during bloom, BUT, the stretched intervals and poor coverage are likely the main culprits. They tank-mixed with a contact during that at-risk spray, but that technique cannot overcome the challenges presented with stretched intervals.</p> <p>For this situation, the grower can still test for FRAC 11 fungicide resistance, given their spray practices may have encouraged resistance selection and that might pose a problem for next year. However, their best approach would be to be more conscious of product efficacy intervals and make sure those match disease pressure in future seasons.</p>



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<p>Scenario 3</p> <p>In this scenario, the spray program has early-season 10-day intervals, with consistent mid-season 14 to 18-day intervals, which is appropriate for the warmer, drier (and lower disease pressure) weather conditions.</p>	<p>Warmer, drier weather conditions – lower disease pressure</p>	<p>Appears to be excess water on the spray cards. Might be indicative that the spray cards were left outside during damp conditions or could be an indication that <i>too much</i> spray was used, or the sprayer is not properly calibrated, resulting in spray run-off. Run-off is a form of drift, which might result in less active ingredient on the vine for mildew protection.</p>	<p>In this scenario, there are likely 2 main reasons for lack of disease control. First, the excessive run-off as indicated by the color of the spray cards, could mean that product is not staying on the plant – it is moving off the leaves and onto the ground. That would result in insufficient product staying where it needs to be. If that is a routine problem in this vineyard, it could mean that below-label rates are commonly applied, which could be a starting point for the development of fungicide resistance. The second reason could be related to fungicide resistance. Even though intervals were good, and there was a tank mix of sulfur, in the situation where there might be resistance in a product, the efficacy window for that spray is only as good as the least-effective product. The FRAC 11 spray at bloom, tank mixed with sulfur, would likely only truly have an efficacy window of 7 days if the FRAC 11 fungicide was compromised. Given almost everything else looks good in that program, the lack of disease control and the specific use of a FRAC 11 fungicide at bloom, could indicate that there might be a problem with fungicide resistance in the vineyard.</p> <p>For this situation, we recommend the vineyard get tested for potential FRAC 11 fungicide resistance and focus on recalibrating their sprayer and adjust spray volume to not have run-off.</p>
<p>Scenario 4</p> <p>This program has several instances of stretched intervals. First, 14-day intervals were used with an oil product during periods of rapid early-season growth. That was followed with 21 to 22 day intervals with synthetic products.</p>	<p>Warmer, drier weather conditions- – lower disease pressure</p>	<p>Coverage is un-even. Little to no droplets seen in the fruit zone, good spray coverage in the canopy. This could mean that in the process of spraying, fruit was not getting adequate coverage, and thus, may not have been protected from powdery mildew infection.</p>	<p>This scenario also has likely two main reasons for lack of disease control. First, is the uneven coverage as seen on the spray cards. The upper canopy appears to have good coverage, while the fruit zone is having less-than-ideal coverage. This may have resulted in visibly good disease control on the canopy, while the fruit was unprotected (and likely, harder to see that an outbreak was building up). The second reason is likely related to stretched application intervals. Contact products used during periods of fast growth cannot provide 14-day protection. Synthetic products, even though they may have up to 21 days of efficacy on their label, likely shouldn't be stretched to that during the critical bloom period (when the canopy might still be actively growing as well). This is especially true given the lack of consistent coverage in the fruit zone.</p> <p>For this situation, the grower should consider a spray program that can be completed on 10-day intervals (at the most) early season when using contact products (7 day intervals in high-pressure), and 14 day intervals (if allowed on the label) during the critical window for fruit control. They should also calibrate their sprayer.</p>