

## Sustainable Viticulture Weed Management

As part of environmentally responsible vineyard management, it is not necessary to have pristine weed control throughout the season. The most critical time for weed control is budbreak through veraison, although at that point, some additional weed growth is not viticulturally harmful. However, weeds should not interfere with harvest activities nor should weeds be allowed to proliferate to the point that future weed control is difficult.

|  | 1  | 2  | 3                                 | 4  | SCORE |
|--|--|--|-----------------------------------|--|-------|
| <b>Is vineyard monitored and mapped for weeds?</b> | Grower or vineyard manager monitors weeds 3 times during the season.<br><i>AND</i><br>Weed infestations are recorded and mapped. | Grower or vineyard manager monitors weeds periodically.<br><i>AND</i><br>Weed infestations are recorded and/or mapped. | Weeds are monitored periodically. | Weed composition monitored rarely if ever. |       |

The best way to prevent new weed problems is to keep good records. Weeds of the Northeast (see reference section) is an excellent reference book for identifying weed species. Also, weed photos can easily be found on the internet. Try <http://www.wssa.net/>.

|   |  |   |   |  |  |
|---|--|---|---|--|--|
| <b>What percent of permanent ground cover lies between rows?</b><br><i>In vineyards more than one year old.</i> | >75% of area between rows contains permanent ground cover. | 66-75% of area between rows is covered. | 50-66% of area between rows is covered. | <50 % of area between rows is covered.<br><i>OR</i><br>Row middles tilled. |  |
|---|--|---|---|--|--|

The maximum amount of soil should be covered to prevent erosion and foster non-competitive species diversity.

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|   | 1  | 2   | 3   | 4   | SCORE |
|---|--|---|---|---|-------|
| <p><b>Are non-chemical weed management techniques being used?</b></p>   | <p>Non-chemical techniques are used exclusively.<br/><i>AND</i><br/>Only minimally disruptive cultivation under the trellis is used. Deep cultivation or tillage is avoided.<br/><i>AND</i><br/>Erosion is controlled.</p> | <p>Non-chemical techniques used in combination with post-emergence (foliar-applied) herbicides.<br/><i>AND</i><br/>Only minimally disruptive cultivation under the trellis is used. Deep cultivation or tillage is avoided.<br/><i>AND</i><br/>Erosion is controlled.</p> | <p>Herbicides are the only form of weed control under the trellis<br/><i>AND</i><br/>Only minimally disruptive cultivation under the trellis is used. Deep cultivation or tillage is avoided.<br/><i>AND</i><br/>Erosion is controlled.</p> | <p>Herbicides are the only form of weed control under the trellis.<br/><i>OR</i><br/>Frequent, deep cultivation is used.<br/><i>OR</i><br/>Erosion is not controlled.</p> |       |
| <p><b>In planning a weed control program, how are control methods and rates chosen?</b></p> <p><small>From Ohmart and Matthiasson (2000).</small></p> | <p>No herbicides used.</p>   | <p>Foliar-applied (post-emergence) herbicides are the only herbicides used.<br/><i>AND</i><br/>They are chosen based on weed species present.<br/><i>AND</i><br/>Rates are based on weed species and size.</p>  | <p>Soil-applied pre-emergence herbicides are chosen. Rates are based on weed species and soil type.</p>   | <p>All-purpose tank mixes and standard rates are used for all vineyard blocks.</p>  |       |

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| <p><b>Are the leaching potential of herbicides and soil characteristics considered in choosing soil-applied herbicides?</b></p> <p>From Ohmart and Matthiasson (2000).</p> | <p>Simazine (Princep), diuron (Karmex), and norflurazon (Solicam) are not used.</p> | <p>Simazine, diuron, and norflurazon are used less than annually but not in gravelly or sandy soils with high leaching potential or in areas with high water tables.</p> | <p>Simazine, diuron, and norflurazon are used annually, but not in gravelly or sandy soils with high leaching potential or in areas with high water tables.</p> | <p>Simazine, diuron, and norflurazon are used regardless of soil leaching potential.</p> |       |

These three herbicides are known to leach into ground and surface waters. Currently simazine can be found in groundwater on Long Island and in surface waters in the Finger Lakes. Norflurazon (Solicam) is not labeled for use in Nassau and Suffolk counties.

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| <b>What type of herbicide sprayer is used?</b>  | Application equipment that increases deposition and reduces drift is used.<br>Example: CDA shielded sprayer. | A standard herbicide sprayer is equipped with air induction nozzles and/or a shield in order to increase deposition and reduce drift. |   | Application equipment is not designed to increase deposition or reduce drift. |       |
| <p>Controlled Droplet Applicators (CDAs) use a spinning disc rotary atomizer that creates a mist of similar size droplets under the dome or shield. This technology allows ultra-low volumes to be used, minimizes drift, and places the herbicide efficiently. Efficient and timely placement of postemergent materials may allow a reduction in rate of material used. Practical experience dictates that these sprayers are less effective with dense stands of weeds.</p> <p>Air induction nozzles (discussed in the NY and PA Pest Management Guidelines for Grapes) are well proven with herbicide application and are recommended.</p> |  |   |   |   |       |
| <b>Is the herbicide sprayer calibrated properly?</b>  | Sprayer is serviced and calibrated before the start of each season.  |   | Sprayer is calibrated infrequently or only after repairs. | Sprayer is not calibrated.  |       |

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| <b>Are residual broadleaf and grass herbicides rotated to reduce the potential for resistant weeds?</b>   | Every third year, herbicides are rotated to another chemical family.   | Every fourth year, herbicides are rotated to another chemical family.   |   | Herbicides used are always the same.   |       |
| <p>This is primarily a weed resistance management strategy. However, weeds can easily develop cross-resistance to substituted ureas (Karmex) and triazines (Princep). Therefore, oxyfluorfen (Goal) or flumioxazin (Chateau) should be a rotational choice.</p> <p>The length of control of grass weeds during the season decreases after several years of reapplication of the same material. Soil microbe populations are thought to build up over time, which consume the herbicide molecule as a food source.</p> |  |   |   |  |       |
| <b>Is the amount of spring residual herbicide adjusted based on soil characteristics?</b>   | Based on knowledge of soil types within your vineyard and characteristics of soil-applied herbicides, application rates are adjusted to apply proper amounts in each vineyard block. | Based on knowledge of soil types within your vineyard and characteristics of soil-applied herbicides (see table), application rates are adjusted to apply proper amounts for the entire vineyard. |   | The historical rate and/or the maximum-labeled rate is applied throughout the vineyard. Soil type and herbicide characteristics are ignored. |       |
| Refer to table on leachability and other characteristics of residual herbicides.  |  |   |   |  |       |

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| <b>What type of post-emergence herbicides is used?</b>   |   | Low toxicity and/or rapid breakdown in environment.<br>e.g. Roundup Ultra, Touchdown, Poast, Rely, Aim or Scythe. |                      | High applicator toxicity or long soil half-life.<br>e.g. Gramoxone (paraquat) |       |
| Paraquat is persistent in the soil for more than one year after application. Although generally unavailable to soil microbes, some studies have found that initial application is harmful to beneficial microbes. Rely (glufosinate) is not registered for use in Nassau and Suffolk counties. |   |   |                      |   |       |
| <b>How often are post-emergence herbicides applied?</b>  | Applied once at appropriate time or not at all. | Applied twice at appropriate times.   | Applied three times. | Applied more than three times.  |       |
| Refer to the NY and PA Pest Management Guidelines for Grapes for appropriate timing of post-emergence herbicide application.   |   |   |                      |   |       |

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| <p><b>Is spot treatment of visible weeds used to reduce total amount of post-emergence herbicides?</b></p>   | <p>No post-emergence herbicide needed or applied.</p> | <p>Vineyard weed scouting used to identify weed patches.<br/><i>AND</i><br/>Visible weeds are treated with a manual hand gun sprayer.<br/><i>OR</i><br/>Machine sprayer manually turned off when no weeds are present.</p> |   | <p>Spray applied to entire vineyard without regard to the presence of visible weeds.</p> |       |
| <p>New technology allows infrared sensors to detect the difference between weeds and bare ground. Sensors operate sprayer to apply only to weeds and not bare ground. This technology is not yet sufficiently tested in vineyards.</p> |   |  |   |  |       |