Spraying Vineyards Effectively

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http://pawinegrape.com/
Vineyard Spraying

• Better spray practices could do more to improve fruit quality in Pennsylvania than any single vineyard practice.
• Spraying is not intuitive
• Effective spraying is the result of doing your homework, using the right equipment and materials and proper calibration
• Do not develop bad habits, learn from a skilled applicator
• Obtain and maintain the PDA pesticide applicator’s license
• Use common sense! E.g. weather, vineyard and vine conditions
Spray Equipment

- Proper size and powered tractor (Drive and PTO HP)
- Positive pressure spray cab with AC (music and video optional)
- Not old and dilapidated, in good condition, unquestionably in good service and repair, and effective
- Airblast, towers, tunnel, over-row sprayers: pros and cons
- Backpacks – pump or air-assist: pros and cons
- Low vs. high volume sprayers: electro-static
- Manufacturers
- Service and parts – Murphy’s Law and downy mildew
Vines

- Plant disease-resistant cultivars
- Design and manage vineyard for balanced vines
- Consider canopy density and leaf layers
- Increase airflow – row direction and fruit wire height
- Decrease shade over the vineyard and inside the vine
- Trellis and training systems: single vs divided, vertical and horizontal
It’s easier and more effective to spray a balanced vine
Equipment Care

• Proper care, maintenance and storage of spray equipment
• Pumps, hoses, filters and screens, nozzle parts, gauges, tires, PTO, grease fittings, etc.
Air

• The plume: bigger is not better!
• Size of fan and multiple speed selection
• Regulating air speed and flow
  – Cornell donut
  – Cornell louvres
  – Fan gearbox
• Direction
  – Selection and direction of nozzles
  – Cornell deflectors
• Air vortex effect (blow-by effect), especially with clusters
Nozzles

• What is the target?
• Number of nozzles
• Location
• Output of each nozzle – mix and match disc and cores
• Clean and in good condition, check for wear
Pressure

- Check spray pressure at the pump and nozzle
- Lower pressure reduces drift
- High pressure atomizes droplets
Speed

• Constant speed, check constantly
• Use vine spacing as a measuring stick
• Speed varies up and down slopes
Spray Drift

- Droplet size
- Spray height
- Operating speed
- Wind velocity
- Air temperature and humidity (>77F + low RH)
- Time of application
Calibrating

- Speed, pressure, output
- Using the book
- Checking on the spray pad
- Checking in the field
- Speed – 2.5 to 3 mph: lower speed gives better coverage
  - 100 feet (# vines) at 3 mph takes 23 seconds
- Pressure – 60 to 100 psi: higher pressure yields smaller droplets and more drift
- Output – gallons per acre: early vs. full canopy (30-100 gpa)
- Check your work with a Cornell or Keen spray patternator

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GPM = \frac{GPA \times MPH \times W}{5940}
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In the Field

- Check and maintain constant speed
- End of vine rows
- Driving pattern – skip 2 > skip 1 > skip 2 > skip 1 > skip 2 > reverse pattern or every other row across the field and back again
- Check calibration based on volume used and field size
- Monitor pressure
- Check spray to target accuracy and coverage
Scout

• Disease and pest identification
• Canopy condition
• Weather conditions
• Grape variety
• Know your hot spots
Resources

- Effective Vineyard Spraying by Dr. Andrew Landers, Cornell University
- NY/PA Pest Management Guidelines for Grapes (update annually)
- Penn State Pesticide Education
- Pennsylvania Pesticide Applicators License (private for most grape growers)
The Best in the Business:
Dr Andrew Landers, Cornell Agricultural Engineer

John Santos, Hazlitt 1852
Grape grower extraordinaire!