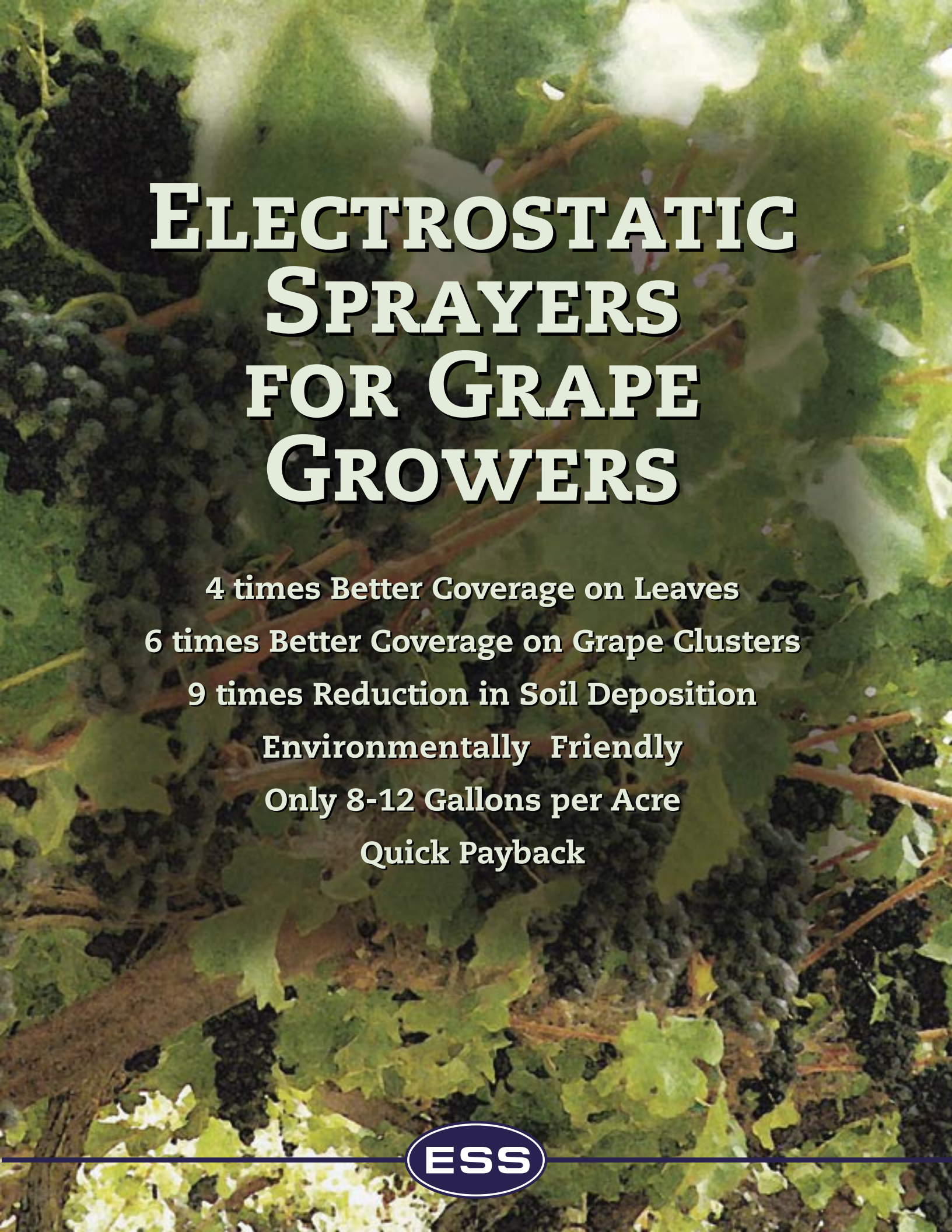


Electrostatic Sprayers for Grape Growers

4 times Better Coverage on Leaves

6 times Better Coverage on Grape Clusters

9 times Reduction in Soil Deposition

Environmentally Friendly

Only 8-12 Gallons per Acre

Quick Payback

ESS

Figure 1. Comparison of sprayers for coverage on plants and on the ground. (Western, 1993)

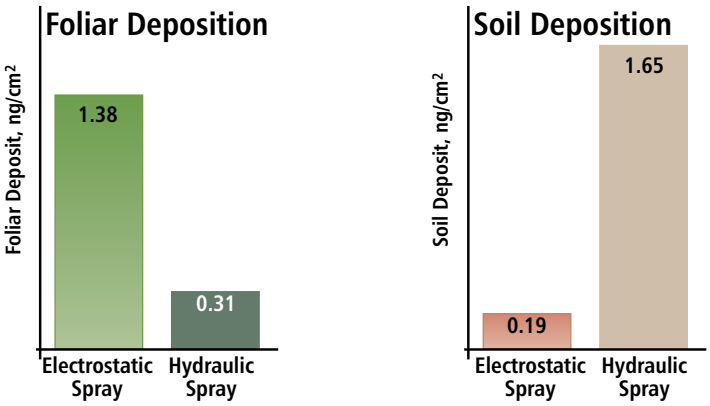
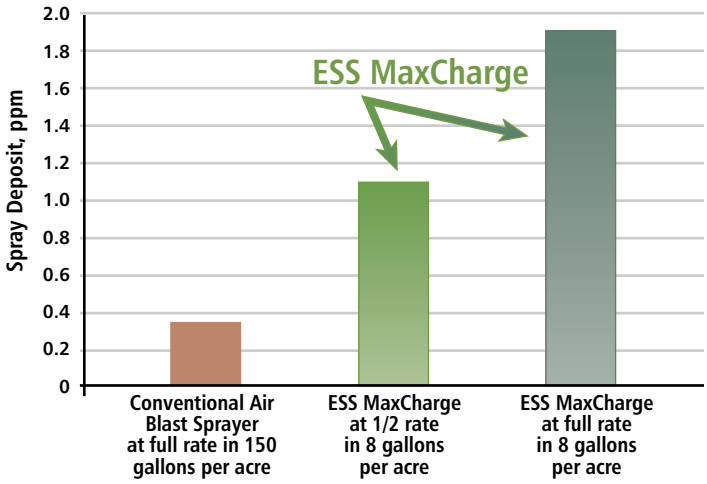


Figure 2. Spray deposition onto grapes at the interior of the cluster. (U. Catolica de Chile, Sobitec Harnois, 1997)



How much chemical can you afford to waste?

It may surprise you, but only 15% to 20% of the spray from your conventional or air blast sprayer ends up on the plants. Nearly 60% of the chemical goes wasted onto the ground and less than 3% ends up on the undersides of leaves or other hidden areas. These percentages come from separate studies done at the Universities of California, Georgia, Illinois and Chile. This means that for every $100 you spend for chemicals, only about $3 worth ends up where you need it (Figure 1).

Use less - get more

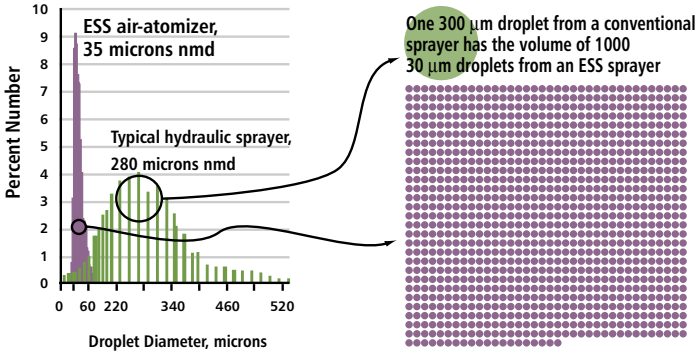
With ESS systems many growers reduce their chemical amount by 1/2 and the amount of water by 20 times. But, less water doesn't mean less spray power. Figure 2 shows field test results of ESS at full and half chemical rates on grapes located at the interior of the cluster. Even at 1/2 chemical rate and 1/20th of the water, the ESS system put 3-times more on the interior grapes than the air-blast type conventional sprayer. Reduced chemical dosages work well with growth regulators too. The table grapes shown in Figure 3 had 1/2 rate applications of all chemicals (including Gibberellic Acid and Ethrel) at only 5 to 8 gallons of water per acre.

The advantage of small droplets with maximum charge

ESS sprayers use the MaxCharge nozzle which is specially designed to create very small size droplets with a big electrical charge. The charge level is well above 3 milliCoulombs per liter - the minimum required for a good electrostatic benefit. The combination of high electrical charge and the optimum droplet size (and weight) causes the spray to move against gravity and wrap-around to deposit on leaf undersides as seen in Figure 5 (opposite page).

Figure 3. Uniform coloring and size of table grapes after 1/2 rate applications of all sprays.

Figure 4. Droplet size is an important parameter in sprayer performance. Droplets between 25 and 60 microns enhance spray coverage and are best for insect and disease control. The volume of one 300 micron diameter drop equals 1000 droplets of 30 microns. (Ohio State Univ.)



Agricultural scientists have known for a long time that small droplets (in the range of 25 to 60 microns) work best for insect and disease control, as well as for foliar fertilizers and plant growth regulators. In the past only conventional sprayers operating at very high pressure (over 3000 psi) could produce droplets in this small size range - and without electrical charge they would drift away easily.

An electrical attraction force of 80-times gravity

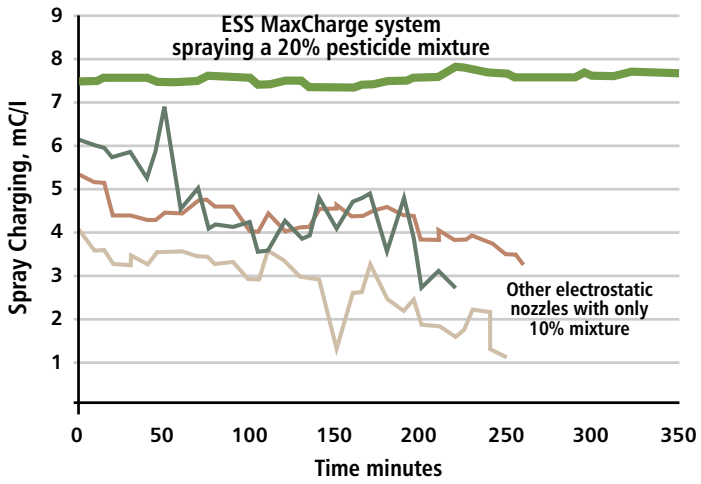
Now, with the ESS MaxCharge electrostatic nozzle, small droplets can be used because the charge is high enough to drive the light droplets to the plants with an electrical force of greater than 80 times gravity. In addition, the MaxCharge nozzle needs only 15 to 30 psi to create the small droplets. The droplet size spectrum for the MaxCharge nozzle and that of a typical high pressure conventional nozzle are compared in Figure 4. The average droplet size for the MaxCharge is 35 microns and the spectrum is very narrow. The conventional spray nozzle produces an average droplet of about 280 microns and the spectrum is very wide. Figure 4 also shows why smaller droplets give better coverage — 1000 spray droplets of 30 microns from an ESS equals the volume of a single 300 micron droplet from a conventional sprayer. Small droplets with ESS MaxCharge add up to a big coverage advantage.

MaxCharge from ESS: Higher charging than ever before

The new MaxCharge spray nozzle, shown in Figure 7, was designed to make electrostatic spraying safe, reliable and easy. There are three integral keys to good electrostatic spraying in agriculture; 1) small droplet size, 2) air delivery, and 3) a high charging level. The MaxCharge system delivers all three ingredients in a tough proven

Figure 5. Highly charged spray from ESS MaxCharge nozzle is attracted to all plant surfaces.

Figure 6. Charging level is important for electrostatic coverage. The new MaxCharge system outperforms all others.



package. The MaxCharge nozzle uses compressed air to atomize the spray and carry the droplets into the plant canopy in a turbulent cloud. As air moves through the nozzle, it is accelerated to the speed of sound and impacts the liquid stream creating the optimum size (35 micron) droplets. Embedded inside the nozzle's tip is a special electrode that focuses an electric field onto the surface of the spray stream. This method of charging creates very high charge density on the spray without using high voltage or power. In fact, it takes less electrical power to run an ESS grape sprayer than a tractor headlight.

Works with all classes of chemicals

The MaxCharge system gives higher spray charge than all other electrostatic sprayers. The charging level is well over the 3 mC/liter minimum necessary for electrostatic sprayers. More charge means better spray coverage. Most importantly the spray charge level stays high with all classes of chemicals. Figure 6 shows a charging performance test comparing the MaxCharge to other electrostatic nozzles that have been on the market. After running for a time with chemicals the other nozzles stop charging adequately as the electrodes become contaminated, ionized or wet. The unique patented design of the MaxCharge nozzle stops this unwanted effect. ESS

Figure 7. The ESS MaxCharge air-assisted electrostatic spray nozzle.

makes it easy for you to check the spray charging quickly while you are rinsing the sprayer with a charge meter provided with every grape sprayer.

Easy to disassemble and clean

MaxCharge is 10 times faster to clean than other electrostatic systems. Just twist off the nozzle's cover - no tools are required, there are no small parts to lose, no wire at the tip, and no problems lining things up to reassemble.

Lasts twice as long

We use a hardened stainless steel electrode that is corrosion proof and non-ionizing. The patented non-ionizing feature means that internal electrical pitting and arcing of the nozzle's tip and electrode are eliminated for better charging and atomization performance over time. The abrasion resistant nozzle outlet provides triple the wear resistance of previous designs.

ESS guarantees the performance of every MaxCharge nozzle. MaxCharge nozzles are available only on ESS brand air-assisted rowcrop, vineyard, greenhouse and specialty sprayers or from ESS certified sprayer manufacturers. Protected by U.S. patents 5,704,554, 5,765,761 and other patents pending. ESS reserves the right to make product improvements.

Make sure it's an ESS MaxCharge for long-term high-charging electrostatic performance.

MAXCHARGE™ with ceramic

For more information call ESS today:
(706) 769-0025
www.maxcharge.com

ESS

Electrostatic Spraying Systems

62 Morrison St., Watkinsville, GA, 30677
Ph: (706) 769-0025 Fax: (706) 769-8072

Electrostatic Sprayers for Grape Growers

Overhead trellis style (Model H-150HT)

Vertical trellis style (Model H-150VT)

Single row style sprayers for vertical or horizontal trellis systems

- 14 or 24 Air-assisted MaxCharge electrostatic nozzles
- 100 gallon poly tank (12 acres/fill)
- Easy 3-point hitch mounting
- Control box with valve control and easy-to-see electrostatic charge indicators
- PTO requires only 15 hp for air compressor
- Heavy duty construction all around
- Delivered fully assembled; ready to spray
- Weight empty: 400 kg (900 lbs)
- Weight full: 750 kg (1650 lbs)

These specialized sprayers will fit into very low overhead trellis plantings and very narrow vertical rows. The 3-point hitch design is light in weight and much more convenient to operate than conventional trailer type sprayers. The 85 gallon tank capacity will allow covering 12 acres on a single tank fill up. This is a small sprayer that can handle a big job.