

All About Airblast Applications



Understanding how airblast sprayers work will help you minimize the use of pesticides.

Volume

Spray volume generated by airblast sprayers is generally measured in gallons per acre (GPA). This volume can be modified or adjusted by changing ground speed of the application traveling through the grove, by using different nozzle types or sizes, by modifying pressure, or by changing the number of spray nozzles by supplying product into the air stream.

For taller citrus trees (greater than 14 feet tall), the common practice is to direct more (approximately one-half to two-thirds) of the spray volume toward the upper half of the tree. This volume adjustment is easily done by directing the deflectors and nozzles in the desired direction.

For pest management purposes, spray volume is adjusted depending on the targeted pest as well as the location of the pest within the tree canopy. Application volumes can range between 25 gallons to 500 gallons per acre, with most applications in the 100 GPA range. For pests that reside on the tree trunk, higher spray volumes are required to adequately reach the target pest. The spray vol-

ume of a volume may not effectively cover the target site.

Parts

All airblast sprayers consist of the following basic items: tank, agitation, pumps, strainers, pressure regulators, flow cutoff valves, and nozzles.

Tanks vary in size, generally ranging from 50 to 1,000 gallons and are made of corrosion-resistant materials. A good tank design minimizes corners or angles that could increase the chance for materials in the spray solution to settle prior to application. The tank should have an opening large enough for filling or cleaning and a drain in the bottom of the tank.

Agitation in the tank is essential to keep materials in suspension, thus allowing all applied material to be at the same concentration during application. Inadequate agitation may cause powders, emulsified concentrates, or oils to separate or layer within the tank, resulting in poor pest control or tree damage.

The pumps selected must be resistant to wear or corrosion and have adequate capacity in both gallons per minute and pressure to achieve the desired application rate. Frequently used pumps include centrifugal, roller, or piston pumps that vary with manufacturer and application design.

Strainers on most airblast sprayers are usually in at least three locations: the fill-point within the tank, line, and nozzle. The capacity of the strainer increases from the fill point to nozzles, where the smallest strainers are located just before the nozzle. The strainers are identified by the number of openings per linear inch of screen, such that a 20-mesh strainer has large openings and will not block the small material caught by a 50-mesh screen.

Pressure regulators provide two

functions on every machine. These devices regulate system pressure and can relieve excessive pressure back into the tank when the valves for application are closed.

Pressure gauges should be located where the operator can easily see the gauge during all pesticide applications. These gauges should be located between the pressure regulator and nozzles and have an operating range greater than the peak pressure that can be generated by the pump. If the pressure gauge will not return to zero when not in use, it should be replaced.

Nozzles come in many shapes, sizes, and materials and are designed to apply a specific amount of material at various pressures. Nozzles may be manufactured from aluminum, plastic, brass, stainless steel, tungsten carbide, and ceramic. Tungsten carbide and ceramic will last the longest and have good corrosion resistance.

Sensing Systems

Many of the newer sprayers are now being delivered or retrofitted with sensors that control pesticide delivery to the individual tree canopy based upon actual tree-canopy size. These sensors adjust valve opening or closing to apply spray material only into the section of the air stream where foliage is present. These new sensing systems can greatly decrease the amount of spray material being applied, saving the grower valuable resources while not impacting the effectiveness of the product. Additionally, lower application amounts of pesticides can reduce potential adverse impact to the environment.



For more information regarding agricultural tree crop pest control, please consult UF/IFAS Extension publication SM 63, Agricultural Tree Crop Pest Control by Dr. Fred Fishel.

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