Avoiding excessive spray drift is a key objective for applicators. With increasing acreage planted to herbicide-resistant crops and a shift to more postemergence spraying, the potential for off-target plant damage has increased in recent years. Off-site damage is often readily apparent in adjacent farmland and rural acreages.

Excessive wind velocity is a dominant factor in drift situations. Several factors in spray equipment set-up and operation, however, should also be considered to help avoid spray movement outside the target area. An important concept in reducing spray drift is the use of larger droplet sizes. Larger droplets are less affected by surrounding air and more likely to stay on-course in reaching the selected target. Larger droplets do reduce coverage, though, and the herbicide label should be consulted for any specific recommendations on nozzle type, operating pressure, application rate, and adjuvant use.

Pressure, boom height, nozzle size
Reducing operating pressure of existing tips increases average droplet size and reduces drift. Flow rate is reduced so it may be necessary to increase nozzle tip size to stay within a labeled application rate. Using a larger nozzle tip size also increases droplet size, reducing drift. Be sure to keep application rate and pressure within any range specified by the herbicide label.

Pre-orifice nozzles
For many years, Delavan, Inc. has marketed Raindrop® nozzle tips that produce large droplet sizes relatively independent of operating pressure. A cap limits the release of small droplets and pressure is reduced internally within the nozzle. These tips have been popular for soil-applied herbicides. More recently manufacturers have developed nozzles that use a pre-orifice to reduce pressure within the nozzle. Such nozzle tips are often called drift-reduction flat fan nozzles and are commonly used to obtain larger droplets at a given operating pressure.

Turbulence chamber nozzles
Recent designs in nozzles have added the use of a turbulence chamber to further absorb energy within the tip and increase droplet size. Examples include Spraying Systems, Inc.’s Turbo Teejet® in a small, flat fan tip design and Turbo Floodjet® in a flooding tip design. Both produce larger droplet sizes than similar nozzles operated at a specific pressure without the turbulence chamber. Because the Turbo...
Teejet® maintains its pattern over a wide pressure range, 15 – 90 psi, it is an excellent choice to use with a spray controller which is varying flow rate (and pressure) with travel speed.

**Combined effects**

Employing any of the following factors: using a drift-reducing tip, larger tip, or lower pressure will tend to increase droplet size. For example, although air induction tips often produce a larger droplet size than those with a turbulence chamber, a larger-size turbulence chamber tip operated at lower pressure may produce a droplet size equivalent to a smaller-size air induction tip operated at higher pressure (both nozzles applying the same flow rate). Thus any of the several methods listed may be used independently or in combination to reduce drift. For specific flow rates, operating pressures, and nozzle types increase in average droplet size by tip style will vary. In tests, however, droplet size for a given pressure and tip size commonly increases 10 to 20% as nozzle type goes from flat fan to pre-orifice to turbulence chamber to air induction style tip.

**Air induction nozzles**

Most recently designers have further increased droplet size by inducing air into the liquid stream inside the nozzle body. After spray flows through a metering pre-orifice inside the nozzle body, an inlet port introduces air into the liquid by venturi action. The droplets containing entrained air are generally larger than those produced by similar size nozzles using only a pre-orifice or turbulence chamber.