Amine or Ester Formulation?

Source: www.TurfMagazine.com

One of the questions we sometimes get from lawn care professionals is whether they should use an amine or ester formulation for postemergence broadleaf weed control.

Synthetic auxin herbicides (including 2,4-D, 2,4-DP, dicamba, triclopyr and MCPA) are commonly formulated in two distinct forms: amine salts and esters.

Amine formulations are generally less volatile than esters and safer to use when applying near sensitive plants, such as ornamental landscapes and gardens.

Ester formulations have a higher vapor pressure and generally a higher volatilization potential—with the exception of certain formulations labeled as “low volatile.”

Research has documented that fall applications with amine or ester formulations of 2,4-D provide optimum broadleaf weed control. However, spring applications are sometimes needed in weedy locations or when you miss an opportunity to make a fall application.

Purdue University research demonstrated that during cooler spring months (for instance, April in Indiana), ester formulations are more effective than amine formulations for broadleaf weed control because they more readily penetrate the waxy leaf cuticle.

As temperatures warm in early summer, turf managers should switch to amine formulations because they work as well as esters and amine formulations are less volatile than ester formulations, making them safer to use around landscape
plantings.

To help track weather conditions and the appropriate time to use amine and ester formulations, visit Michigan State University Extension’s GDD Tracker.

Another concern that lawn care pros mention when applying weed controls is herbicide volatility.

Volatility is the movement of an herbicide in the air as a gas or vapor. This is different than drift, which is the movement of airborne spray particles during the application. Volatilization occurs after an application when the herbicide volatilizes (or vaporizes) and moves in the air as a gas.

Volatility can increase in hot, dry conditions. The concern with volatilization is that herbicides might move off-target and cause damage to desirable ornamentals, fruits, vegetables and other plants.

Volatility is highly influenced by herbicide selection.

Several formulations are referred to as “low volatile” formulations to advertise their reduced risk. The chemical’s vapor pressure is a good way to figure out its volatilization potential. As mentioned previously in this short article, amines have a lower vapor pressure and thus a lower risk of volatilization than esters. However, within the esters there are different levels of volatility and some esters are formulated to reduce this risk.

Therefore, if you are in a situation when you want to use 2,4-D ester near sensitive plants:

1. Consider waiting until fall when ornamentals are less susceptible.
2. Consider switching to an amine if possible.
3. Look for a low-volatile 2,4-D ester to help reduce the risk.
For example, Brushmaster, Super Trimec, Weedone LV4 EC and others contain low-volatile ester formulations of 2,4-D.