

Herbicide efficacy linked to weather

by JEFF LEFTON/Mainscape, Inc.

Numerous factors influence the success or failure of a broadleaf herbicide application. Salt formulations, for instance, are more influenced by environmental factors than ester formulations. Look at the label to determine if the formulation is a salt or ester.

The environmental conditions that influence performance are air and soil temperature, light intensity, wind, rain fall after the application, drought stress, relative humidity and dew formation. Usually, more than one factor combined will determine the success or failure of a broadleaf herbicide application.

Air and soil temp

Spring broadleaf herbicides will not be effective if night temperatures are below freezing. Scientific data suggests that esters can be used in the mid-spring when:

- nighttime temperature stays above 32 degrees F;
- the soil temperature is above 45 degrees F;
- daytime temperature is above 45 degrees F;
- after 110 units of Growing Degree Days (base=50 degrees F).

Scientific data also suggests that salt formulations will become more effective when:

- the soil temperature stays above 55 degrees F;
- the air temperature is above 60 degrees F;
- after 150 units of Growing Degree Days (base=50 degrees F).

University data suggests that fall applications do not require using esters in cooler weather. The reason for this is the high soil temperature. In general, for fall broadleaf weed control applications, you can expect actual weed control in the late fall or the following spring. For very late fall applications, the herbicide is absorbed and translocated. However, symptoms and death will not be apparent until the following spring.

Ambient factors

Light generally enhances the phytotoxicity of broadleaf herbicides by increasing the absorption and translocation of sugar compounds. The broadleaf herbicide is transported with the sugar compounds in a piggy-back fashion. Sunny conditions usually result in greater herbicide activity than cloudy, overcast skies. Broadleaf weeds

translocate a great amount of sugar compounds in the fall downward. Because of that, fall weed applications will normally result in a broader range of broadleaf weed control.

Wind dries the herbicide on the leaf surface. Maximum uptake of a herbicide on the leaf surface depends on the length of time it remains on the surface in a liquid state. Wind can dry out the solution, and limit up-

take by plants.

Salt formulations are more adversely affected by rainfall soon after the application than esters.

A rain-free period of four hours after the application is best for the efficacy of most salt-formulated herbicides.

Broadleaf herbicides are usually less effective in controlling drought-stressed plants than actively growing, unstressed plants because herbicide absorption and translocation is drastically reduced.

The absorption of salt formulations is greatly influenced by the **relative humidity** for up to 24 hours after the application. Herbicides are absorbed as liquids. High relative humidity will help keep the upper leaf surface hydrated, for better penetration of amine salts. The herbicide remains wetter on the leaf surface for a longer period of time, and more is absorbed.

Dew formation the day after the application will normally help increase herbicide penetration from salt formulations. Dew can re-dissolve the salt herbicide on the leaf surface. This increases the chance for additional absorption. Esters cannot be re-dissolved with dew.

Surfactants may help under extreme circumstances. An example would be continued misty weather in the spring. A 0.5% solution could allow the herbicide a chance to hold on the surface and be absorbed under these very specific conditions.

A late summer application of a broadleaf weed control may not be very effective. In many cases, the weather may still be dry, even with cooler temperatures. In addition, many of the broadleaf weeds have not germinated. The late fall fertilization round could actually grow more weeds due to poor timing of the last application. Lawns properly treated with a herbicide in the fall should be somewhat weed-free the following spring.

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Maximum uptake of herbicide on the leaf surface depends on the length of time it remains liquid on the surface.