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Why Herbicides Sometimes Fail:

An Overview for Forestry and Wildlife Practices

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Why Herbicides Sometimes Fail:
An Overview for Forestry and Wildlife Practices

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Private landowners and contractors regularly use herbicides to achieve forestry and wildlife management objectives, including site preparation, food plot maintenance, seedling and sapling release, thinning, cull tree removal (or creation), and control of invasive species. The result of herbicide applications is normally satisfactory, provided the manufacturers' directions are properly followed. However, sometimes the results are disappointing even with experienced applicators.

There are a number of explanations for why herbicides sometimes fail to perform as intended, and they are summarized in this publication.

Precipitation

Probably the most common reason for herbicide failure is that the herbicide is washed away shortly after application due to a rainfall event. This is true with liquid and granular (particularly with a heavy rain event) herbicides. Liquid herbicides have a "rain-fast" period, in which precipitation could possibly move the herbicide off-target before it can be taken up by the weeds. These rain-fast periods are found on the herbicide label and the length of time varies by herbicide. Some herbicides need only an hour of time after application before a rain event occurs to be effective. Other herbicides require several hours. If rain happens inside the rain-fast period, retreating may be needed. In contrast, herbicides applied in droughty conditions also can fail because of inadequate uptake (either foliar, root or both).

Volatility and Air Temperature

Rapid conversion from a liquid or dry herbicide to a gas can cause some herbicides to move off-target and damage non-target vegetation. This is known as herbicide volatility. Applying under cooler temperatures (daily highs less than 80 F) can help mitigate volatility. In contrast, many herbicides will perform better with warmer (but not hot) air temperatures. During cool or even cloudy weather, plants may not be growing actively and herbicides may not translocate readily. Favorable results will be slow, if at all. Refer to the herbicide label for air temperature recommendations.

Photo credit: Larry Steckel

Improper Application

Failure to calibrate equipment properly, poor site preparation, improper mixing, faulty spray equipment, too much variation in ground speed, excessive wind, etc., all contribute to inconsistency or disappointment.

Photo credit: David Mercker

Not Following Label Directions

Reading and following label directions are not options—they are obligations—when applying herbicides. Following herbicide label directions to the letter will ensure the most likely chance for success. Remember, the label is the law.

Sample label

Failure to Add Surfactant

Surfactant is a liquid sometimes added to herbicides to improve coverage by reducing the surface tension and thereby improving results. Many herbicide labels recommend the use of surfactant, yet this step is often overlooked.

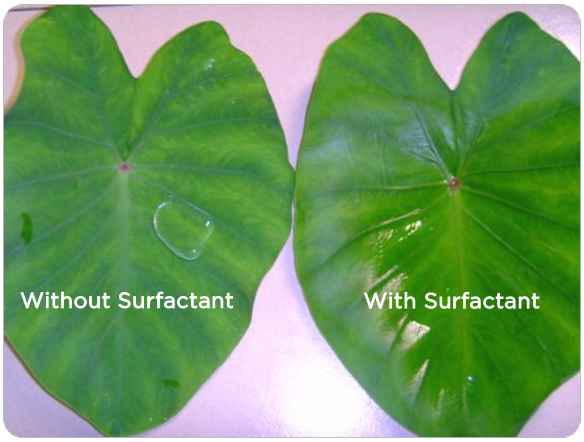


Photo credit: Silibase Silicone

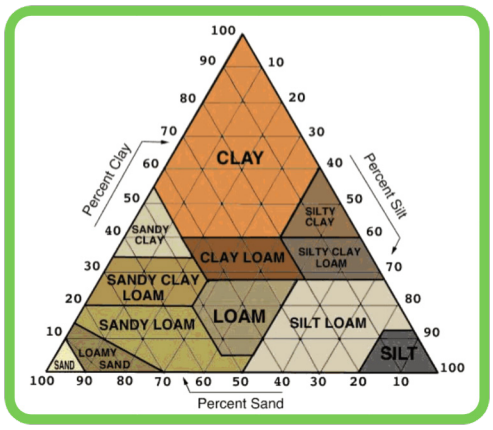
Solubility

Herbicides designed to work as a solution are easier to mix and will more readily stay in solution. Herbicides formulated as suspensions can settle out if not agitated for a period of time, causing very poor performance. This is especially the case if the solution has set due to inactivity, such as at the end of a work day or during a weather event that halts work.

Photo credit: Larry Steckel

Soil Texture

Soil texture is not a common cause of herbicide failure, but it can influence the effectiveness of soil-applied herbicides. Herbicides act more slowly on finely textured soils (clay) than on coarse soils (sand). Often it is necessary to increase the application rate slightly on finely textured soils and soils with high organic matter, and to lower the application rate slightly on coarse soils. The rate adjustments (by soil type) appear on the herbicide label.



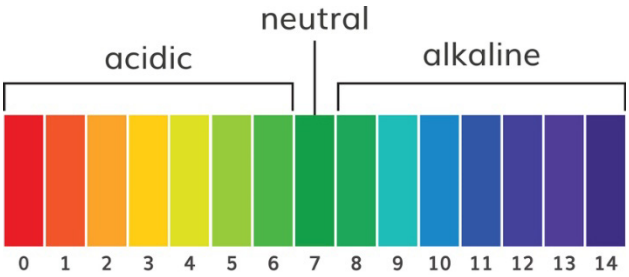
Sap Flow

When applying herbicides to the girdles or frills of certain trees (e.g., maple) in early spring, sap flow can be so aggressive that herbicides are immediately "pushed" back out by the sap, never to reach the roots.

Photo credit: David Mercker

pH of the Water

Herbicides mixed in hard water (high pH) are less effective than in acidic water. The reason for this is that cations associated with hard water (e.g., calcium and magnesium) can tie up herbicides to the point that they will not work effectively. Most water sources are acidic enough that this is not a problem; however, that is not always the case. Adding ammonium sulfate to the spray mixture can help offset hard water issues if they exist. The directions for adding ammonium sulfate to the spray mixture are stated on the herbicide label. Of less concern but worth noting is the soil pH. Check the herbicide label to confirm whether the soil pH is an issue.



Acid and base pH chart

Improper Species Identification

Herbicides are labeled to control specific species of plants. Users should confirm identification of the weed(s) to be controlled and match that with those *listed for control* on the herbicide label.

Photo credit: forestryimages.org/browse/detail.cfm?imgnum=0008418

Photo credit: forestryimages.org/browse/detail.cfm?imgnum=1330011

Thick Bark

Liquid herbicides that are applied (and to be absorbed) directly into the bark of woody plants may not work if the bark is too thick. Examples are older woody shrubs and trees. Oil carriers are often recommended to aid in bark penetration, and if recommended, should be used. Again, the herbicide label will indicate this recommendation.

Photo credit: David Mercker

Concluding Remarks

Landowners who are inexperienced with herbicide application should first seek professional assistance, starting with their local county Extension office or state forestry and wildlife agencies. Restricted-use herbicides require a pesticide applicator's license. However, the vast majority of herbicides used in forestry and wildlife management applications are not restricted-use.

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