



COLORADO ENVIRONMENTAL PESTICIDE EDUCATION PROGRAM

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ADJUVANTS & SURFACTANTS

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This fact sheet provides definitions of adjuvants and surfactants.

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Adjuvants and Surfactants

Adjuvants and surfactants are spray solution additives, and are considered to be any product added to a pesticide solution to improve the performance of the spray mixture.

Adjuvants are not under the same registration guidelines as are pesticides. The [Environmental Protection Agency](#) does not register or approve the labeling of spray adjuvants. There are label-approved adjuvants such that only certain brands of adjuvants can be used with certain pesticides.

Examples of adjuvants include:

- Compatibility agents
- Drift retardants
- Suspension aids
- Spray buffers
- Surfactants

Surfactants (surface active agents) are a type of adjuvant designed to enhance the absorbing, emulsifying, dispersing, spreading, sticking, wetting, or penetrating properties of pesticides. Surfactants are most often used with herbicides to help a pesticide spread over a leaf surface and penetrate the waxy cuticle of a leaf or to penetrate through the small hairs present on a leaf surface.



Surfactant Class Definitions

- **Non-ionic surfactants** are composed of alcohols and/or fatty acids and are compatible with most pesticides. This class of surfactant reduces surface tension and improves spreading, sticking, and pesticide uptake.
- **Crop oil concentrates** are composed of paraffin-based petroleum oil and surfactants. Crop oil concentrates reduce surface tension and improve herbicide uptake and leaf surface spreading.
- **Nitrogen-surfactant blends** consist of premix combinations of various forms of nitrogen and surfactants. They generally are used with herbicides recommending the addition of ammonium sulfate or

28% nitrogen. These surfactants reduce surface tension and improve leaf surface spreading.

- **Esterified seed oils** are produced by reacting fatty acids from seed oils with an alcohol to form esters. The methyl or ethyl esters produced by this reaction are combined with surfactants/emulsifiers to form an esterified seed oil. These surfactants reduce surface tension and improve herbicide uptake by improving herbicide distribution on the leaf surface.
- **Organo-silicones** are usually silicone/surfactant blends of silicone to non-ionic or other surfactants: a few within this classification are composed entirely of silicone. These surfactants provide a tremendous reduction in surface tension and spread more than conventional surfactants. In addition, this class of surfactants provide improved effectiveness through maximum rainfastness.

References and Resources

Adjuvant & Surfactant Guide. 1998. Wilfarm L.L.C., Gladstone, MO.

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