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**


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