

Kill weeds and clean dishes with the same product?

A common “trick” used when spraying weeds around your home may be to add a few drops of dish soap, such as Dawn®. Dish soap is used as a surfactant, both when washing dishes and applying herbicide to plants. While it might effectively remove grease and food from plates, dish soap probably should not be the “go-to” surfactant for herbicides.

Surfactant is a word made-up by combining the words surface, active, and agent. Essentially, a surfactant decreases the surface tension of liquids or the tension between a liquid and solid. Surfactants are comprised of many molecules of which are hydrophilic or hydrophobic. If the molecule looked like a tadpole, the head would be attracted to water (hydrophilic) and the tail would be repelled by water (hydrophobic). This love-hate relationship with water makes the surfactant effective. Water is repelled by oil or grease on dishes, but when soap is added the hydrophobic tail attaches to the oil while the hydrophilic head attaches to the water. The molecule is still intact though making the water also “attached” to the oil which then allows the grime to be rinsed off the plate.

How does knowing what’s going on in our sink help determine surfactant use on plants? The dish example illustrates how a surfactant can aid in coverage of herbicide on a plant. The spray solution containing herbicide and water (hydrophilic end) will be held closely to the leaf which contains certain oils, dust particles, etc. (hydrophobic end). This is typically referred to as making the herbicide “stick” to the plant. In addition to hydrophobic and hydrophilic ends, surfactants carry a charge. Anionic surfactants are negatively charged while positively charged surfactants are cationic. Most surfactants used in herbicide mixtures however are nonionic, meaning they carry no charge. The charge of a surfactant is important as it reacts with charges of certain herbicides and even soil.

Recommendations of “homemade weed killer” abound on the internet from Pinterest to gardening websites. The rate of dish soap added to the mix ranges from a few drops to a few teaspoons of Dawn® dishwashing liquid. After browsing the store aisles and the internet, there are literally dozens of types of dishwashing liquid! Some are concentrated, some have bleach, some have scents, and some even have enzymes. All of these ingredients may not be listed on the label individually, but rather grouped under “inert” ingredients. Since all the ingredients are not listed, it becomes difficult to determine if a specific dish soap is anionic, nonionic, or more hydrophobic than hydrophilic.

Now that the chemistry lesson is over, the bottom line is using dish soap as a surfactant can be complicated. Ultimately, there are far better products available to reduce surface tension and using dish soap may cost more money in the long run. A pint or gallon of nonionic surfactant with a shelf-life of about five years can be purchased at local farm and ranch stores. Additionally, the inert ingredients in dish soap may react with the herbicide making it less effective and basically wasting the cost and labor of application. An herbicide label will indicate if a surfactant should be used and the type recommended. For example, if the label calls for a nonionic surfactant and the dish soap added is anionic, the herbicide may become ineffective. Most ready-to-use weed sprays in the lawn and garden will already contain the necessary surfactants making the addition of dish soap futile. Synergistic effects may happen in this instance and actually harm off-target plants. The product label is the best source of information for a herbicide. For more information, contact your local weed and pest control office or Goshen County Weed and Pest at: (307) 532-3713, gocoweeds@embarqmail.com, or <https://www.facebook.com/gocoweeds>.