



FOLIAR ADJUVANTS

Adjuvants include any substance added to the spray tank that modifies the pesticide performance, physical properties and spray mixture.

The right Turf Fuel adjuvant may reduce or eliminate spray application problems, thereby improving overall pesticide efficacy.

Spray application is perhaps the weakest link in the chain of events a pesticide follows through its selection and use process. Multiple researchers have concluded that as much as 30%-50% loss of the effectiveness of a pesticide depends on the effectiveness of the spray application.



PH SENSITIVITY

The water used to fill spray tanks has a dramatic impact on the stability of chemicals and the length of time the materials will remain effective in solution. A reaction called alkaline hydrolysis takes place when high pH water literally rips the chemistry apart. Many pesticides will break down very quickly when spray tank water is above a pH of 7. In some cases the effectiveness of the chemistry can be rendered ineffective in less time than it takes to conduct the spray application. Maintaining favourable spray tank pH will also improve the mixing of products in the spray tank. Ideal spray tank pH is 5.0-6.0.



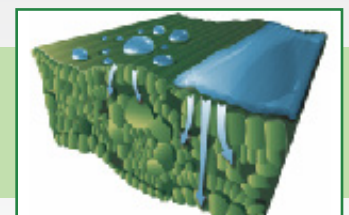
DEPOSITION

Water is naturally a poor carrier of pesticides that need to coat the leaf surface. The formation of water droplets on the leaf reduces the amount of chemistry that can penetrate the waxy cuticle of the leaf. Deposition aids reduce the surface tension of water, enabling the chemicals to evenly coat the leaf surface, leading to exponentially better uptake.



RAINFASTNESS

Rainfall, Irrigation and dew impact the activity of the active ingredient because of dilution, redistribution and removal. Often, efficacy and longevity is reduced because of these factors. This results in non control, the need for higher rates, and more frequent applications. Adjuvants known as stickers ensure that chemistry stays where it is applied as long as possible.



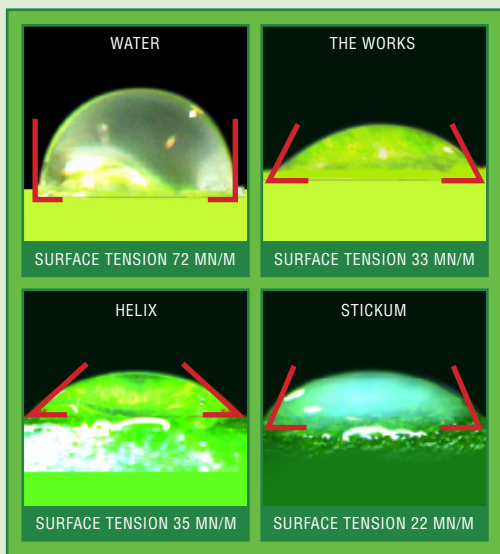
PENETRATION

The ability of an active ingredient to penetrate the leaf surface plays an important role in their systemic activity. The cuticle of the plant leaf is naturally designed to resist the entry of foreign material. Foliar penetrants modify the chemical and physical properties of the plant and chemistry to allow rapid uptake and movement of the chemistry.

Azoxystrobin transcuticular penetration improved from 37% without penetrant to 92% with penetrant. Vladimíra Zelená and Karel Veverka (2010, July 15). *Plant Protect Science. Effect of Surfactants and Liquid Fertilizers on Transcuticular Penetration of Fungicides*

TURF FUEL RESEARCH

Turf Fuel research has shown that **The Works**, **Helix** and **Stickum** have a high impact on reducing surface tension of spray applications. This enhanced spreading action dramatically improves pesticide and nutritional uptake.



REAL WORLD EXAMPLE.

	PRODUCT APPLICATION	
	PROPICONAZOLE 44 OZ./ACRE	AZOXYSTOBIN 44 OZ./ACRE
COST OF SPRAY	\$190.50 / ACRE	
MINIMUM LOSS	30%	
COST OF LOSS	\$57.15 / ACRE	
ADD HELIX	\$8.00 / ACRE	
SAVINGS FROM LOSS	\$49.15 / ACRE	

ADJUVANT SELECTION GUIDE

	THE WORKS	HELIX	STICKUM	TANK PHIX
PH ADJUSTMENT	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
DESPOSITION AID	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
LEAF PENETRANT	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
STICKER	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
DRIFT RETARDANT	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
USE SUGGESTIONS	pH Sensitive Herbicides Terrazole, Mancozeb pH Sensitive Insecticides Windy Conditions Herbicides	Systemic Fungicides Systemic Insecticides Tropical Ornamentals Windy Conditions	Prior to rainfall or irrigation Contact Insecticides Contact Fungicides Overwintering products Where there is risk of UV Degradation	High Spray tank pH Nutritional Tank mixes Hard water situations