



Tip of the Month

July 2017

It's a numbers game!

Pesticides are subjected to various efficacy-limiting factors from when they are added to the spray solution, until the absorption process has been completed. These limiting factors include poor water quality, tank mixture incompatibility, inadequate coverage, insufficient wetting and spreading of spray droplets and finally reduced absorption through the waxy layers on the leaf surface. Adjuvants are designed to assist the pesticide to overcome most of these factors to ensure optimal control. It's a numbers game to ensure that enough pesticide is ultimately absorbed to ensure adequate control. The word adjuvant means "to aid." The pesticides are the stars.....while the adjuvants are the supporting actors!

Water quality

Water is not an ideal candidate to mix pesticides with as it has various limiting factors. However, it is the only practical method to deliver pesticides evenly to the target area. High pH of water results in alkaline hydrolysis of certain insecticides and dissolved cations in water reduce the activity of many herbicides, including glyphosate, certain phenoxy herbicides, certain sulfonyleureas, clethodim etc. This is why the use of buffers with certain insecticides and ammonium sulphate adjuvants with salt-sensitive herbicides, results in minimal losses of pesticide activity due to water quality. Ammonium sulphate often deals successfully with hundreds of grams of antagonistic cations in areas with high dissolved salts!

Spray delivery

The use of water quality rectifying adjuvants ensures that minimal pesticide activity is lost due to dissolved salt content and pH of water. However, this is useless if the active ingredient cannot be delivered effectively to the target. This is where deposition agents are needed to decrease the number of driftable fine droplets in the spray and also to increase the amount of active ingredient that

reaches the lower areas of the crop canopy. Surfactants, oil adjuvants and even stickers can also play an important role during spray delivery by ensuring that fewer droplets run or bounce off the leaf surface. Adjuvants that play a role in pesticide delivery therefore increase the amount of active ingredient that is available for absorption.

Absorption

Once the pesticide has been protected against alkaline hydrolysis and salt antagonism, and it has been delivered in adequate amounts to the target, the next step is to ensure that enough active ingredient is absorbed into the leaf surface. This is where the surfactants and oil adjuvants also play a very important role. Some of these products provide more effective spreading of droplets, especially in cases where a large surface area should be covered, like with contact pesticides. However, both surfactants and oils often also ensure that enough pesticide is absorbed for adequate control. This is provided by increased humectancy provided by some of these products and also by the hydration of the waxy layers on the leaf surface.

Villa's stance

It is a numbers game with pesticides. Adjuvants aid in all processes to increase the rate of pesticide that is delivered to the target. All the six major groups of adjuvants mentioned above, play a pivotal role in pesticide efficacy. These six major adjuvant groups include pH-buffers, salt adjuvants, deposition agents, surfactants, oils and stickers. If used wisely, adjuvants can assist to provide sufficient numbers to ensure pesticide efficacy.

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