



Tip of the Month

March 2020

pH VS AMMONIUM SULPHATE WITH VILLA GLYPHOSATE PRODUCTS

Since glyphosate was introduced more than four decades ago, there have been differences of opinion on how to optimize the efficacy of this incredible herbicide. Everyone agrees that glyphosate is antagonized by antagonistic cations in spray water, but there are many disagreements on how to overcome these antagonistic cations and how to optimize glyphosate activity.

pH and ammonium sulphate will be discussed in more detail below.

Glyphosate is bound by cations

Glyphosate, when dissolved in water, has negatively charged sites available for antagonistic cations like calcium, magnesium and sodium to bind to. When glyphosate is bound to one of these antagonistic cations, it is poorly absorbed into weeds, and therefore the control is decreased. The one school of thought is that by reducing the pH of the glyphosate spray solution, it makes the glyphosate molecule less prone to binding by antagonistic cations. The theory is then that the more that the glyphosate spray solution is acidified, the less it is prone to salt antagonism.

The other school of thought is that by using ammonium sulphate, the antagonistic cations are bound before binding to the glyphosate and this creates an effective form of glyphosate that is readily absorbed by weeds.

Villa's experience

It is important to note that the binding of antagonistic ions to glyphosate occurs at droplet level.

As the droplet dries and the solubility of salts become limited, the binding of antagonistic cations occurs. We have found that ammonium sulphate is the most effective method to overcome this antagonism. The sulphate from the ammonium sulphate binds to the antagonistic cations before they can bind to glyphosate. The glyphosate is then readily absorbed with the help of the ammonium cation. We do not believe that further acidification is needed as glyphosate on its own already reduces the pH sufficiently.

It is true that certain acids are beneficial to glyphosate weed control. This is not always because of the acidification, but often because of the type of acid used. Certain acid-containing adjuvants, if used at the correct rate, can also overcome some of the antagonistic cations found in water.

Villa's stance

In lab trials it was found that Villa glyphosate on its own, already reduces the spray solution pH to an optimal level. This was valid for various water sources with different buffering capacities. Villa therefore believes that ammonium sulphate is the most effective method to overcome antagonistic cations and to increase the activity of glyphosate.

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