Adjuvant

Tip of the Month

May 2017

Pesticide sprays: What could possibly go wrong?

Pesticides must go through multiple processes before the pest or weed is controlled. Firstly, the pesticides are mixed with water, secondly they are delivered via the spray droplets to the target, and thirdly they are spread out and are absorbed into the leaf.

There are multiple factors, like the weather, that are not controllable. It is therefore important to manage all the factors within our control, to ensure adequate pest control.

There are specific adjuvants available that manage these factors in all three phases and it is important to use the correct adjuvants for each phase.

The spray solution phase

This phase occurs for the full period while the pesticide is mixed in the spray solution. Pesticides are mixed with water in order to deliver them at the correct, evenly distributed rate, to the target area. This is one of the reasons why there are different formulation types like EC, SC, SL, WP etc., to enable pesticides to mix effectively with water.

The problem is that water can also be regarded as a chemical because it always contains dissolved antagonistic salts and has a specific pH. Furthermore, certain water qualities can contribute to tank-mixture incompatibility. It is important to have an extensive knowledge of water quality and how dissolved antagonistic salts interact and decrease the efficacy of certain herbicides.

It is also important to know that a high pH induces alkaline hydrolysis of certain insecticides. Adjuvants that negate the abovementioned factors are important in this first phase to maintain the efficacy of specific pesticides.

Please take note that not all pesticides are affected by salt antagonism or alkaline hydrolysis, therefore the standard use of salt adjuvants and buffers could be a waste of money in certain cases.

The spray droplet phase

The spray droplet phase has been neglected to an extent in South Africa. For any pesticide to perform effectively there must be adequate coverage of the target. This is achieved by both application technology and adjuvants. It is vitally important that a minimal volume of the spray solution is lost due to drift and evaporation of spray droplets.

Effective spray application technology and deposition agents can ensure more pesticide coverage on the target, and more effective control.

The plant phase

Once the droplet is deposited onto the leaf surface, only two thirds of the journey has been completed! The droplet then has to spread out adequately for optimal contact with the leaf surface. Please take note that excessive droplet spreading is not always beneficial and certain pesticides do not benefit from this because of a dilution effect.

The very last step in the process, before translocation, is absorption through the waxy layers on the leaf surface. Absorption is influenced very strongly by environmental factors like low humidity. It is therefore important that the correct surfactant or oil adjuvant is used in this phase to ensure pesticide efficacy.

Villa recommendation

The phases described above give a clear indication of the complexities surrounding pesticide efficacy. If adjuvants are used for any of these phases, please ensure that you use registered, quality products that are backed up by extensive research.

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