



# Tip of the Month

July 2020

## BUFFERS IN PERSPECTIVE

Buffers are products that change and maintain the spray solution pH. Although different buffers change and stabilize the pH to different levels, the pH range of 4 to 6 is the most common. These products are used predominantly with insecticides to limit alkaline hydrolysis but are also used with other crop protection products (CPP) that require a specific pH range. The buffers that are registered in South Africa normally contain a weak organic acid as the principle active ingredient, but other acids are occasionally used. Buffers may also contain other ingredients in the formulation, but these components will not be discussed here.

### pH of water

Buffers are normally added first to the spray water before any CPP are included. The buffer reduces the spray water pH to a predetermined range, most often to between pH 4 to 6. It is important to ensure that this pH range will be reached with the recommended rate of buffer. It is also vitally important that the pH is then stabilized within this pH range, therefore minimal pH reduction as more product is added. If a calculation error is made and too much buffer is included, the pH should still be in or near the correct pH range. Water sources have different buffering capacities because of the salts that they contain. It is important that buffers reduce the pH of different water sources into this correct pH range. If not, one would always doubt whether the spray solution pH has been adjusted enough. The opposite is also true as an extremely low pH also has significant disadvantages, like physical incompatibility, acid breakdown and insolubility of certain CPP.

### pH and electrical conductivity (EC)

There is a common perception that buffers increase the EC of the spray solution, which in turn antagonizes the CPP. It is true that most buffers will increase the EC of spray solutions, simply because they contain salts and ions. However, the ions contained in buffers are often neutral to most CPP and should therefore not influence efficacy. There may be exceptions to the rule when other acids are used. Therefore it is important that only the Villa buffers are used with Villa CPP as the necessary tests have been done. These buffers should ensure the correct pH range over most buffering capacities, without the addition of any antagonistic cations or anions.

### Villa's stance

Buffers are important products, but it is crucial to use them correctly. Please make sure that there is at least one CPP in the spray solution that requires a low pH. Then ensure that the low pH does not antagonize other CPP in the spray solution or cause compatibility issues. Buffers are an investment in the effective management of certain CPP, but they may contribute to inefficacy and incompatibility if used incorrectly.

Contact Brian de Villiers  
for more information on  
adjuvants and water quality  
082 880 0974 or  
[bdevilliers@villacrop.co.za](mailto:bdevilliers@villacrop.co.za)