> *Improved efficacy of up to 10% can be achieved.*

Hidden threat to efficacy?

Technical
Water conditioners

Is your spray water working for or against you? *CPM* takes a look at water quality, how this can affect spray efficacy and what can be done about it.

By Rob Jones

Getting the most out of contact herbicides has rarely been more important than this spring after an autumn during which opportunities to apply residual herbicides were few and far between. That means optimizing the efficacy of herbicides will be key, says ProCam agronomist Mike Thornton. He believes water conditioning with an acidifying agent could help achieve this in some situations.

Having worked extensively in areas of hard water in Sussex, Mike knows only too well the variability that can result from applications where the pH of water in the spray tank is sub-optimal. He says it's a phenomenon which can lead to vastly reduced weed control and field margins where competition from aggressive grassweeds becomes a problem.

With grassweeds increasingly difficult to control, there are benefits for incremental gains wherever they can be found. And making sure some of the herbicide isn't being locked up by salts in the spray water is one way of getting a performance gain, he points out.

"We know that hard water, where the pH ranges from 6.5 and above, can produce consistently poor results," he explains. "Cations such as calcium and magnesium aggressively bind to the molecules of active ingredients, which instantly means reduced activity. This then leads to the variability in weed control that we so often see."

Mixing procedure

An important part of maximising the benefit from a water conditioner involves understanding how it works so the correct mixing procedure is followed. For best results Mike stresses it's essential the conditioning product is always added to the tank first, as per the label instruction, and at a maximum concentration of 0.25% of spray volume. He also highlights water quality can vary from farm to farm and that rainwater sources can be totally different to groundwater so there is no one-size-fits-all strategy.

"Groundwater from the chalk aquifers can be exceptionally hard. For contact herbicides such as Atlantis (mesosulfuron-methyl+ iodosulfuron-methyl), and other graminicides like Falcon (propaquizafop) and Laser (cycloxydim), conditioning the water in the tank first, before adding the herbicide product, is essential. Our experience here has proven that by decreasing the pH of the spray solution by acidification, improved efficacy of up to 10% can be achieved and that's significant."

Mike has been using X-Clude from De Sangosse, which softens hard water by completely and irreversibly sequestering harmful cations such as calcium and magnesium present in the water. The water conditioner also acidifies water to pH 4.6, which prevents alkaline hydrolysis, and has a 'built-in' humectant and anti-foaming agent.

"Different herbicides will respond in different ways. With the pressures likely to be facing us this spring, anything we can do to improve herbicide programmes has to be considered. There are so many variables but starting with the best possible water quality is essential," he says.

Mike has also been using X-Clude in insecticide programmes, particularly those where pyrethroids or neonicotinoids are recommended.

"We've seen a lot of benefit in conditioning the water prior to applying products for cabbage stem flea beetle control in oilseed rape and the results are encouraging. Wherever the hardness of the water could an issue, we're advising our growers to include X-Clude in the tank mix.

"It's not a panacea but it can provide small incremental gains for relatively little cost, which can add up significantly overall."

One of Mike's growers is taking the water conditioning approach one stage further and altering the pH of water he uses

Mike Thornton explains sub-optimal pH of spray water can affect the efficacy of chemistry.

in the spray tank at source.

"He's found using X-Clude in the primary water source and conditioning in bulk saves operator time and reduces the chance of inconsistencies occurring," he says. "We feel that in areas where excessively hard water exists, this approach will also dramatically reduce the pressure on active ingredients.

"Where herbicide costs constitute the bulk of the expenditure on crops, protecting that investment has to be a priority. Using X-Clude is proving to be a very consistent way of achieving that," believes Mike.

In situations where agronomists advise adding water conditioners to water at source, Kettering-based company Hingerose can provide the Dosatron range of water-powered proportional injector units. These enable the accurate dosing of liquid additives into water.

These units have been employed by livestock, horticultural and agricultural businesses to deliver water conditioners, nutrients and fertilisers, potato fungicides, livestock supplements and medication, for over four decades.

Hingerose general manager Kris Jessiman says that pre-1970 there was a 'bucket and chuck it' mentality when it came to mixing additives into water. In comparison with current practice, there was little understanding of the impact poor application was having on performance, spray mixture quality, ease of handling and the environment.

"The livestock industry was the first farming group to use Dosatron for accurate dosing to enhance performance. Horticulturalists soon caught on to the benefits of automatic dosing," he says.

Pre-dosing water

"And then it was the agricultural contractors and sprayer operators that recognized the benefits of pre-dosing water with conditioners to help lower pH and remove the effects of water hardness. Typically treated water now goes into a holding tank, where it can then be transferred to the sprayer on demand.

"Dosatron is driven by water flow, so it doesn't need electric power which makes it very reliable and simple. Depending on the model being used, dose rates can be set from 0.03% to 25%, mixing solutions on demand and removing the need for the operator to come into contact or handle potentially aggressive products," explains Kris.

"It responds directly to the flow-rate of the water passing through it, essentially using directly proportional and accurate dosing to ensure the correct amount of concentrate is applied and mixed with the water supply."

Kris Jessiman explains the Dosatron is a water-powered proportional injector unit that's ideal for treating water at source.

The specific Dosatron unit recommended by De Sangosse is the D3RE2, which operates at 10-3000 l/hr and can administer 0.2-2% of product into the water. ■