

## THE CHEMICAL COMPATIBILITY OF PLASMA POWER WITH 'UNIMAZ 250SL' AND 'SPARK' The Importance of Understanding the Reactions and Responses

by Steve Wornes, Senior Process Chemist



Recently a very quick response was sought from RLF's Senior Process Chemist about the tank mix compatibility of PLASMA POWER with the herbicides UNIMAZ 250SL (UPL) and SPARK (CropCare).

Further information for the Chemist noted that UNIMAZ 250SL contains the active ingredient imazapyr (present as the isopropylamine salt) while the active ingredient in SPARK is imazapic (present as the ammonium salt).

### The Background

RLF's long-term and valued client was about to spray his crops with Plasma Power when our team representative alerted him to the potential for problems and advised seeking further technical information and advice before doing so. RLF's Ask the Chemist 'real-time' service is invaluable, and the importance of this is highlighted with this particular scenario. Having a clear understanding of the compatibility issues and chemical reactions and responses enables our farmer clients to make decisions based on science and the very best advice.

### The Chemist's Response

The active ingredients in both UNIMAZ 250SL & SPARK (imazapyr and imazapic, respectively) belong to the group of imidazolinone herbicides and contain nicotinic acid functional groups.

These compounds have greatest stability at a pH that is mildly acidic to alkaline (pH 5-9), which is one of the main reasons imidazolinones are formulated as amine salts at an alkaline pH.

Mixing pesticide formulations that are alkaline with acidic RLF products will result in an acid-base neutralisation reaction which, depending on the concentration of each component, may cause heating of the spray solution [e.g. similar to the reported reaction and generation of heat when RLF foliar products are tank mixed with alkaline clopyralid formulations (LONTREL; Dow Agrosiences)].

The main criteria in assessing chemical compatibility for tank mixes of this kind is the pH of the final spray solution.

As the pH of the pesticide formulation is reduced, the percentage of active ingredient that exists in the organic acid (non-ionised) form, compared to the ionised form, increases. The organic acid forms are not appreciably soluble in water, which is another main reason why these compounds are formulated at alkaline pH as amine (ionised) salts which are water soluble. As the percentage of active ingredient existing as the organic acid increases a corresponding loss in bio-efficacy is likely.

In this instance there are three main factors for consideration :

1. the possibility of excessive heat generation from neutralisation of the pesticide with the acidic foliar fertiliser
2. the instability of the pesticide active ingredients at pH <5 and loss of bio-efficacy as a result of hydrolysis under acidic conditions
3. precipitation of the pesticide active ingredients as the corresponding organic acids at pH <4.

Even if the products are physically compatible, any recommendation for this tank mix should be made with the full knowledge that biological efficacy of the pesticide may be compromised, especially if the pH of the final spray solution is less than 4.

### ASK THE CHEMIST

[Click here to ask a question to RLF's Senior Process Chemist](#)



The content of this media page was accurate and current at the time that it was written. This media release is provided for interested customers and other parties, and will remain a matter of RLF's historical record. Viewed in this context RLF therefore undertakes no obligation to update either material or content.