

### Summary

**Number:** GK 06/02  
**Title:** Optimisation of herbicide efficacy  
**Duration:** 1997 – 2014  
**Status:** Continuation of existing project  
**Project leader:** Ms H Nienaber

This project seeks solutions for overcoming the problem of antagonistic herbicide spray mixtures in South Africa. 21 experiments were conducted during the 2010/2011 season.

Experiments were conducted on Roundup<sup>®</sup>, Roundup Turbo<sup>®</sup> and MCPA<sup>®</sup> to determine the effect of the new experimental adjuvant and various other registered/non-registered adjuvants on the percentage weed control of different herbicides. Experiments were also conducted to test the effect of different buffers on Roundup Turbo<sup>®</sup> efficacy.

The results obtained from the MCPA<sup>®</sup> experiments indicate that any added adjuvant to the spray mixture do not increase the percentage weed control significantly. Some adjuvants even caused antagonism, which led to a decrease in percentage control. It would therefore be recommended that none of the tested adjuvants be used with MCPA<sup>®</sup>.

Experiments with various adjuvants and Roundup<sup>®</sup> (glycine) showed that some adjuvants can cause antagonistic spray mixtures (eg. Pro-Net Alpha) in deionized water. It was again proven that CaCl<sub>2</sub> water (hard water) and NaHCO<sub>3</sub> water (brackish water) has a negative impact on the efficacy of glycines. All adjuvants were able to overcome antagonism in these two water types. It was found in numerous experiments that Velocity-Dry added at 1% of the spray volume is the best adjuvant to use with Roundup<sup>®</sup> or Roundup Turbo<sup>®</sup>. Experiments with buffers and glycines indicated that most buffers can improve the efficacy of glycines. The statement that all ammonium sulphate containing products perform equally was proven incorrect. Even the same products with the same name can perform differently from one another. This is alarming because the producer does not know what quality product he/she is buying. Some batches within a certain product may even show a significant difference between them. Producers must be warned about this. It was also confirmed that not all 'claim to fame' are what people say it is. Many products show substandard performance (eg. Cyflo).

Experiments with the experimental adjuvant for Roundup<sup>®</sup> and Roundup Turbo<sup>®</sup> concluded that with some fine tuning this adjuvant can possibly be registered.

In general, the results indicate that a significant increase in herbicide efficacy can be accomplished by the addition of the appropriate adjuvant. These results hold exciting prospects for industry, as it may assist with more effective control of weeds, which remains a significant and ongoing problem in the cultivation of small grains in South Africa.

During the past year technology was transferred through various ways. A poster presentation was made at the 2011 Combined Congress and one article was published in SA Grain. A leaflet was also handed out at the SKOG day.