

GK 05/17: APHID REPELLENTS TO MINIMIZE BARLEY YELLOW DWARF VIRUS TRANSMISSION BY APHIDS IN WHEAT PROGRESS REPORT APRIL 2010 – MARCH 2011

Summary

Number: GK05/17
Title: Aphid repellents to minimize barley yellow dwarf virus transmission by aphids in wheat.
Duration: 2007 - 2013
Status: Continuing
Project leader: Dr GJ Prinsloo

Rose grain aphid and oat aphid are the most abundant aphids in irrigation fields and these aphids are both transmitters of Barley Yellow dwarf and *Bromus* mosaic viruses. Both viruses are increasing in intensity under irrigation and are causing yield losses of ± 2 t/ha in isolated cases. It is thus very important to prevent the virus transmission by aphids, especially early in the season, when plants are still small.

Rose grain aphid was not effectively repelled by compounds that are repellent to other wheat aphids in the laboratory. The range of compounds tested on rose grain aphid should be expanded and plant extracts included. A new method to analyze the laboratory data was developed. This method enables us to distinguish between the repellent potential of different compounds and plant extracts and can identify the most suitable compounds to be used. This method was used to indicate that oat aphid was best repelled by an aqueous extract of *Artemisia* and an oil extract of *Datura*. All previous data will be analyzed in this way during the next year.

A field trial treated with different repellent compounds could not demonstrate significant repellence of aphids by these compounds, but slight responses were found with compound A and *Cymbopogon* c essential oil. The effect, is however, only visible for one week and a better formulation with slow releasing volatiles should be developed. These results correspond with the results from 2010 and should be investigated further.

Flight patterns of oat aphid indicated that they move into the wheat fields from June to the end of July in the Winterton area. This is a potentially high risk period for the transmission of virus when the wheat is still small. The earlier the virus is transmitted, the more dangerous the effect could be. The presence of slow released repellent volatiles during this period could reduce the landing and probing of aphids and thus virus transmission. Compressed wheat bran pellets and fire lighter blocks saturated with a volatile compound released the compound only for a five day period which is too short. Other formulations should be identified and tested in the glasshouse before being incorporated into field trials. It is thus of utmost importance that an effective formulation for the volatiles should be found.

In conclusion: Rose grain aphid does not respond well to some of the volatile compounds tested and the rest of the compounds tested on the oat aphid should be tested on this species. A slight reduction in aphid numbers by two treatments was recorded for a second season. Effective slow release formulations are needed for application of these volatiles.