

HGCA Research and Development, Annual Project Report, 2011 results

Project number:	RD-2008-3498
Project title:	Strategies to reduce the impact of <i>Turnip yellows virus</i> on oilseed rape production in the UK
Lead partner:	Mark Stevens / Bill Clark
Scientific partners:	
Industry partners:	Keith Norman (Velcourt)
Government sponsor:	
Start date and duration:	1/1/09; 40 months

Project aim:	To raise the awareness of and develop integrated strategies for the control of TuYV in oilseed rape in the UK and to raise the productivity of UK oilseed rape.
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Key messages emerging from the project:
<ul style="list-style-type: none">• The TuYV surveys have shown that the previous autumn aphid activity is highly influential on the following levels of TuYV in the spring. For example, there was little aphid activity in 2010, and consequently few infected plants were found in 2011 compared to the previous spring. However, hotspot areas do appear to exist and include areas along the south coast and around the Wash.• Seed treatments provide early protection, BUT can be compromised by high numbers of viruliferous aphids.• In sequentially inoculated trials at Broom's Barn, with appropriate plots inoculated with TuYV (from September through to March) there was a relationship between the timing of infection and subsequent yield loss. Greatest losses (15%) were observed in plots from the earliest infections.• All 49 of the 2009 RL oilseed rape varieties are susceptible to TuYV when inoculated with viruliferous aphids. However, there are significant differences between varieties which could be ranked in the spring according to their virus titre and symptom expression. Subsequent analysis of a subset of these varieties that varied in their response to TuYV, further emphasised this difference (both yield and oil quality).• Highest virus concentrations have been observed in roots of infected oilseed rape plants during the summer. This is a new finding.• Throughout the project the number of <i>Myzus persicae</i> carrying TuYV has remained approximately at 30%.• TuYV remains an important disease of UK oilseed rape and must be considered as a factor that limits the yield potential of the crop in this country.

The results described in these summary reports are interim and relate to one year. In all cases, the reports refer to projects that extend over a number of years. The HGCA has provided funding for this project but has not conducted the research or written this report. While the author has worked on the best information available to them, neither HGCA nor the author shall be liable for any loss, damage or injury howsoever suffered directly or indirectly in relation to the report or the research on which it is based. Reference herein to trade names and proprietary products without stating that they are protected does not imply that they may be regarded as unprotected and thus free for general use. No endorsement of named products is intended, nor is any criticism implied of other alternative, but unnamed products.

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Summary of results from reporting year:

- TuYV infection in 2011 was much less than the previous year (33% of sites contained TuYV, the highest measured infection level was 12% and infection ranged from 2% - 12%) following the lower migration of aphids in the autumn, and the very cold temperatures experienced as early as November (-13°C or less). This effectively killed the few aphids that were present, and prevented further spread.
- 9 of 10 selected varieties showed an effect of TuYV on yield that ranged from 5-25%; the exception was WCOR07-1.
- There was no consistent effect of TuYV infection on photosynthesis on a subset of these varieties.
- TuYV reduced the oil content of seed in 9 of 10 varieties tested by up to 4%; the exception was DK Cabernet.
- The 2010/11 sequential inoculation trial again demonstrated that the earlier the infection with TuYV (September and October) the greater the yield losses.
- The 2011/2012 season is likely to be one with significantly higher levels of infection due to the large number of aphids that have colonized OSR late in the season this year, and especially after the neonicotinoid seed treatments are likely to have worn off; the relatively mild winter is likely to have encouraged substantial secondary spread.

Key issues to be addressed in the next year:

This project will end in March 2012 and no new further work is planned. However, areas that need further investigation include:

- Identification of sources of resistance to TuYV / marker development.
- Effects on physiology and growth of current varieties.
- Annual monitoring of virus-carrying aphids in the autumn.
- Annual Surveys of TuYV distribution in the following spring.

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