MAR10 Pest of the month – March 2010

Fig. 1. Wheat curl mite cleared and slide mounted (a); Wheat curl mites feeding within leaf veins (b); Stunted wheat crop resulting from *Wheat streak mosaic virus* infection (c). Photo credits: Department of Agriculture and Food WA.

Aceria tosichella Keifer

Pest: Wheat curl mite; *Aceria tosichella*
Classification: P: Arthropoda, C: Arachnida, O: Prostigmata, F: Eriophyidae.

The Wheat curl mite (WCM) is a threat to Australia's wheat production via its ability to transmit viruses of wheat. It is a tiny, wingless mite which travels by wind and cannot be controlled by pesticide. It has led to severe yield loss of wheat crops in the Great Plains region of the United States.

The Pest: WCM was first described by Keifer (1969) found on wheat in Yugoslavia. It has since been found in many wheat-growing regions of the world including North America, Europe, the Middle East and Australia. WCM reproduce rapidly at temperatures between 24 and 27°C, where it can live for 8-10 days. A single female is capable of laying 12-20 eggs, hence producing more than 3 million descendants within 60 days. It typically colonises the youngest tissue of wheat plants, and is most detectable at milk and dough development growth stages (Z71-85) where they can be found in the glumes and seed creases. The main mode of distribution is by wind where they crawl to leaf edges or awns, anchor their bodies with their anal sucker, and release themselves on wind currents with their featherclaws positioned outwards. WCM can survive 4-6 days without a living host.

Key distinguishing features: <3 mm long, dorsal shield pattern and length, 7-8 rays on empodium I (first featherclaw).

Host Range: It is mainly found on cereals and grasses. Wheat is the primary host, but WCM have been found on 60 other plant species.

Impact: WCM is the only known vector of *Wheat streak mosaic virus* (WSMV), which has been identified in commercial wheat crops throughout Australian grainbelts. WSMV can cause severe yield loss in wheat, especially when introduced during early seedling development. Worst-case crop infection occurs when WCM present in volunteer wheat are triggered to disperse as a result of host plants dying (from pre-sowing herbicide application) coinciding with the time of crop germination. This 'green bridge' allows for carryover of viruliferous mites. There are currently no WCM or WSMV resistant wheat varieties available in Australia. WCM also vector *High plains virus*, which has been identified in the eastern States only, and other viruses of wheat not yet found in Australia: *Wheat spot mosaic virus*, *Wheat spot chlorosis pathogen*, *Cereal spotting*, and *Triticum mosaic virus.*

Detection and control: WCM can only be seen with a microscope. Diagnosis of species includes morphology of slide mounted specimens or via electron microscopy, or specific PCR primers. Control of WCM is achieved by destruction of host material by pre-sowing herbicide application (with ample time to "break the green bridge"), tillage or grazing.

Further Reading: Coutts *et al.* (2009) Wheat streak mosaic virus and wheat curl mite, Farmnote no. 342, Department of Agriculture and Food WA.; GRDC (2009) The wheat curl mite, Fact Sheet; www.wheatcurlmite.org.

Key Contact: Dusty Severtson; e-mail: dsevertson@agric.wa.gov.au, DAFWA, Phone: (08) 9368 3249