

Sorghum midge (*Stenodiplosis sorghicola*) in sorghum

	Pre-plant	Flowering
Signs	<p>After harvest, larvae enter an overwintering diapause in cocoons within damaged or trashed florets.</p> <p>The first generation of midge is typically in Johnson Grass.</p>	<ul style="list-style-type: none"> • Female midge are visible in and around flowering heads. • The first midge are often seen in spiders webs – a sign that midge are active • Midge adults only live for one day and most egg lays occur in the morning. • Changes in weather can bring midge into fields (from Johnson grass, early sorghum crops) at any time of day. • Infestation is evident by white pupal cases that stick out of the tips of glumes. • A short lifecycle (2-4 weeks) allows many generations per season and enables rapid build-up of very high midge densities especially where flowering period of sorghum is extended by successive plantings.
Monitoring		<p>Midge numbers can vary widely both within a crop and between plants. Thorough sampling is critical to estimate midge abundance.</p> <ul style="list-style-type: none"> • Count adult midge on flowering heads at about mid-morning (peak midge activity generally occurs between 9 and 11 am). • Look for the orange-red abdomen of the midge female, which distinguishes it from the parasitoid wasps that may also be present. • Look for midge over 10 metres of row in at least 4 locations • Monitor very closely for midge numbers every day during head emergence and flowering. It is easy to underestimate midge numbers. • Look for movement of the small red flies against the top half of mid flowering panicle. On windy days you may have to hold each head still and shelter the panicle with your body. • Alternatively, beat heads into a bucket and count the number of midge dislodged per head. • Previous midge activity can be evident by the presence of pupal cases sticking out of affected glumes
Beneficials	<p>Three small black wasp parasitoids play a role in the control of sorghum midge: <i>Eupelmus</i> sp., <i>Tetrastichus</i> sp. and <i>Aprostocetus</i> sp. In later crops these wasps may be present in high numbers and mistaken for midge. Although they may play a role in suppressing midge populations, these parasitoids are not effective in preventing midge damage to crops when midge pressure is high.</p>	
Cultural control	<p>Resistant hybrids are the mainstay of midge control. Since 1993 all commercial sorghum hybrids have been assigned official midge resistant (MR) ratings from 1-7. A 7-rated hybrid sustains 7 times less damage than a susceptible hybrid (rated 1). In 2002, a new 'open-ended' rating of 8+ was added. Trials have shown that some 8+ hybrids contain levels of resistance that approach 'practical field immunity'. Midge resistant hybrids provide increased flexibility that allows for late season crops when midge pressure is high, and offer benefits in seasons when crop uniformity is affected and crops have an extended flowering.</p> <p>Other options include:</p> <ul style="list-style-type: none"> • Early planting • Remove alternative hosts • Cultural practices to ensure even flowering 	
Thresholds		<p>Threshold levels vary with resistance level of the hybrids and other factors such as commodity price and cost of insecticide. Thresholds can be calculated using the factor of 1.4 gm of grain destroyed for each egg-laying adult. On susceptible hybrids the level is usually about one adult per head.</p> <p>For specific costs of control, midge rating and crop price refer to the online midge threshold calculator at www.thebeatsheet.com.au</p>
Pesticides		<p>Sorghum midge control may require insecticide applications during flowering, particularly in late planted crops which flower when midge pressure is high or in crops where flowering is staggered and heads are susceptible to midge over a period of weeks.</p> <p>Insecticides registered for the control of midge will severely disrupt natural enemies. Refer to the beneficial impact table.</p>

Considerations	<ul style="list-style-type: none"> • Midge control can, in some seasons be combined with NPV for helioverpa or when controlling Rutherglen bug. Do not delay midge control to try and combine treatments as the window for effective midge control is small. • Synthetic pyrethroids also kill beneficial insects that otherwise contribute to the control of other pests e.g. helioverpa and aphids. After treating midge also monitor for potential outbreaks of other pests. • Application of synthetic pyrethroids will incidentally expose helioverpa, and contribute to selecting for pyrethroid resistant individuals in the population. Consider pupae busting the crop if helioverpa larvae were present after mid March to reduce carry-over of an insecticide-resistant population. • Transport of grain containing diapausing larvae is believed to be the main method of spread. Movement of sorghum into Western Australia is presently restricted.
Communication	<p>Good communication and sharing information with agronomists and other growers may provide initial indications of midge presence. Area wide coordination of management methods is useful, particularly variety selection, adjusting planting dates, weed control, monitoring techniques, and spray management plans. Industry publications provide up to date information about regional pest issues</p>