



# African rice gall midge

*Orseolia oryzivora*



Photo: IRRI

'Onion' or silver shoots are an unmistakable symptom of damage by rice gall midge larvae.

**SUMMARY:** Larvae of the African rice gall midge feed on young shoots (tillers) of rice, causing them to stop growing and yields to therefore be reduced. 'Onion' or silver shoots are the most noticeable symptom of infestations and this is unique to the gall midge. A combination of natural control, through encouragement of parasitic wasps, and planting of resistant or tolerant varieties is the most effective method for managing this damaging pest.

## KEY SIGNS

The rice gall midge is a flying insect pest, the larvae of which feed on the growing tips of new rice shoots. The adult midge is mosquito-like and small, up to 5 mm long. In the few days it is alive, the female can lay 200-400 eggs at or near the base of shoots.

The eggs produce larvae (maggots) which move between the leaf sheath and up the stem to the growing tip. There they burrow into young tillers (shoots), which then stop growing. A gall is formed, a swollen area where the larva transforms into a pupa. At first the galls are small, about 3 mm in diameter, and oval but they can extend up to 1.5 metres long. These galls are the distinctive 'onion' or silver shoots which are associated only with gall midge damage. The adult midge eventually emerges from these long, white hollow tubes about three weeks after the initial burrowing by the larva into the tiller.

The death of young tillers stimulates the production of more tillers, which often become infested. Attacks by the gall midge larvae at the early stages of rice plant growth cause stunting and bushiness. Gall midge larvae only feed on rice when it is tillering or producing new shoots. The infested tillers do not produce grain.

## MANAGEMENT

**Prevention** – what to do before signs are seen

*Cultural approaches:* The use of resistant varieties together with preventative measures and natural control will help to reduce damage and increase yields.

Resistant varieties are available for African rice (*Oryza glaberrima*): TOG 7106, 7206 and 7442. For Asian rice (*Oryza sativa*), resistant varieties include: 'Cisadane' (Nigeria), BW 348-1 (Burkina Faso, Nigeria) and TOS 14519 (Gambia). Check if these are available locally. NERICA L-25 is moderately resistant to rice gall midge in Nigeria.

For prevention, neighbouring farmers should ideally plant at the same time to reduce the availability of new plants for emerging adult midges to infest and persist. Sow and plant early to avoid peak insect populations. However, these measures require, respectively, good coordination and cooperation by many farmers, and suitable conditions for early planting.

Be careful with fertilizer application. Too much nitrogen will increase shoot and leaf production and provide more food for the gall midge. High yielding varieties of rice, which respond well to fertilizer application, are also at risk.

There are several parasitic wasps which attack the rice gall midge. Paspalum grass grows naturally with rice: it is attacked by a different type of midge which does not attack rice but is an alternative host for the wasps. Conservation of Paspalum grass (and therefore more parasitic wasps) is encouraged.

The gall midge will survive on wild rice (*Oryzae longistaminata*) and be carried over to the next season in any remaining rice plants – either re-sprouting from cut plants (ratoons) or natural re-seeding (volunteers). Removal of these plants is encouraged.

Both of these approaches may be difficult to achieve on a large scale.

*Chemical approaches:* Insecticides are costly and unlikely to be effective.

## CAUSE

The African rice gall midge is *Orseolia oryzivora*. The closely related Asian species, *Orseolia oryzae*, also attacks rice but is not found in Africa.

African rice gall midge is mainly a pest of rainfed and irrigated lowland rice. The insect prefers high humidity and in wetter years the risk of infestation is higher.

## IMPACT

The gall midge only became a significant problem in the 1970s, when major losses occurred in Burkina Faso. Elsewhere, localized outbreaks were damaging but not seen as a major threat, for example in Zambia. In 1988 things changed dramatically with 40 to 85% of tillers infested in rice grown in the savannah zone of Nigeria, leading to major losses in yield. Around 50,000 hectares were affected. With further outbreaks and closer investigation of gall midge attacks since the Nigeria outbreak, observations in several countries indicate yield losses of between 25 and 80%.

## DISTRIBUTION

In West Africa the gall midge is a major pest in Burkina Faso, Nigeria, Mali and Sierra Leone (where it is known locally as yabas leaf). The pest has also been recorded in many other countries: Senegal, The Gambia, Guinea Bissau, Guinea, Côte d'Ivoire, Ghana, Togo, Benin, Niger, Chad, Sudan (and presumably South Sudan, though this is not confirmed at the time of writing), Uganda, Tanzania, Malawi and Zambia.

## FURTHER READING

Check the Africa Rice website for papers, extension leaflets and up to date information. The following are all available at [www.africarice.org](http://www.africarice.org)

Nwilene FE, Nwanze KF and Okhidievbie (2006). African rice gall midge: biology, ecology and control. Field guide and technical manual. Available from AfricaRice website.

Africa rice gall midge (no date). Reference 22.

Plantwise Knowledge Bank ([www.plantwise.org](http://www.plantwise.org)): Africa rice gall midge: technical fact sheet.

Plantwise Knowledge Bank ([www.plantwise.org](http://www.plantwise.org))

Infonet-Biovision ([www.infonet-biovision.org](http://www.infonet-biovision.org))

Rice Knowledge Bank ([www.knowledgebank.irri.org](http://www.knowledgebank.irri.org))

For information on Paspalum go to: <http://www.cabi.org/isc/datasheet/38955>