



The South American Rice Leaf Miner

Description and Life Cycle

The South American rice leaf miner, *Hydrellia wirthi* Korytkowski, is a newly reported insect pest of rice in the United States. It affected several rice fields in southwest Louisiana and southeast Texas in 2004. The insect was referred to as a whorl maggot because of damage it causes to the whorl of young rice plants.

The South American rice leaf miner belongs to a family of small flies called Ephydriidae. It resembles a closely related and widely distributed species called the rice leaf miner, *Hydrellia griseola* (Fallén), a sporadic pest of rice. Adult females of the South American rice leaf miner lay eggs individually on the leaf surface. There is a reported preference to lay eggs on the distal third of the leaf. Eggs are creamy-white, elongated, ribbed and about 1/50 inch long and 1/100 inch wide. Hatching occurs three to four days after oviposition. The larval cycle lasts eight to 14 days and varies considerably, depending on local conditions. Larvae are smooth, legless and are yellowish or semi-transparent. Mature larvae may reach 1/5 to 3/10 inch in length (Fig. 1).

Pupation lasts five to nine days. Pupae are enclosed in a capsule called puparium, which is made of the last larval skin. The puparium is light brown, elongate, tapered at both ends and about 1/5 inch long and 1/25 inch wide (Fig. 2). A puparium usually is found on the inside surface of the leaf sheath, near the collar area in seedling rice plants (Fig. 3). Additional puparia may be found inside rice stems or tillers and in mines inside the leaf blade. Adults of the South American rice leaf miner are small gray to dark gray flies about 1/10 inch long (Fig. 4).

Injury

Rice plants are susceptible to economic infestations from one to six weeks after emergence. Heavy infestations are characterized by large areas of reduced vegetation in the middle or along the margins of the field (Fig. 5). The larva rasps the leaf surface before the leaf unfurls (Fig. 1). As the leaf expands, yellow damaged areas are more visible. The larva also is known to mine the leaf blade similar to injury caused by the rice leaf miner. Feeding continues on the whorl tissue as the larva enters the stem of developing plants (Fig. 6). It is common to find several maggots in a single stem. Plants infested before tillering stages show large, dry and elongated lesions along the leaf edge. These lesions are longer and wider than those caused by rice water weevil adults. Affected leaves become dry and tend to curl from the beginning of the lesion to the tip. The affected portion of the leaf usually breaks off or remains hanging by a



Figure 1. A larva or maggot scratches the leaf surface before leaf expansion.



Figure 2. The puparium is about 1/5 inch long and 1/25 inch wide.



Figure 3. A puparium on the inside surface of the leaf sheath near the collar area.



Figure 4. Adults are small gray to dark-gray flies about 1/10 inch in length.

thread (Fig. 7). Injured seedling plants look ragged (Fig. 8). Heavy infestations kill young plants, resulting in severely reduced stand densities. Surviving plants have uneven or retarded growth and reduced tiller production. Stunted plants in a reduced stand subsequently drown in a flood or are easily overcome by weeds.

Scouting and Management

To scout for the South American rice leaf miner, inspect fields as soon as the first plants show signs of leaf damage and before stands are reduced. Dissect or split open affected tillers to find larvae or puparia. Some larvae may be found 2 inches deep inside stems. If leaf mines are present, gently draw the leaves between the thumb and forefinger. Bumps in the leaves indicate the presence of a live larva or pupa. Management practices for this new pest in the United States are being investigated. Late-planted fields (rice fields planted after mid May in southwestern Louisiana) may be at higher risk of infestation. Therefore, early planting is recommended in areas where this insect is present. Threshold levels have not been developed. The insect has not revealed apparent varietal preferences for egg-laying and larval development. Both drill-seeded and water-seeded rice are known to be infested; however, specific preference to a planting method and water management practice is under study. In addition to early planting to avoid high infestations, water management and chemical options are being investigated to manage populations. If a South American rice leaf miner infestation is suspected in a rice field, producers should notify their county agents for the latest development and information on management options.

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Pub. 2914

Online Only

6/05 Rev.

Issued in furtherance of Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.



Figure 5. Established infestations produce small to large areas of stunted rice with reduced stand density.



Figure 6. A larva inside the stem of a developing plant.

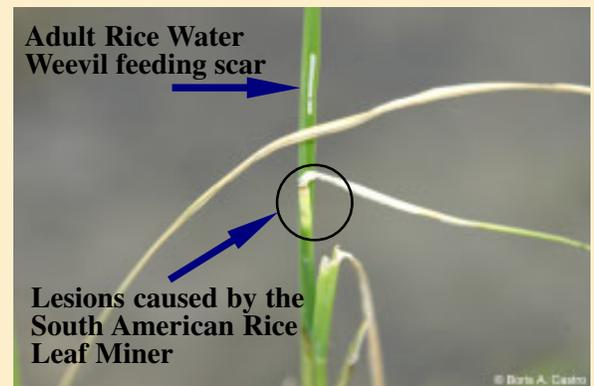


Figure 7. Affected leaves break off or hang by a "thread."



Figure 8. Injured leaves show large, elongated lesions along the margins. Dry leaves may curl from the beginning of the scar until the tip.