

TECHNICAL SHEET

Biological control of the ear leafminer

Headminer

The millet ear miner *Heliocheilus albipunctella* de Joannis is a noctuid insect that is attached to millet (Baoua et al, 2013). Since 1974, it has become one of the major plagues of this crop in the Sahelian zone (Vrecambre, 1978 cited by Baoua et al, 2013). This univoltine lepidopteran lays its eggs on the apex of young millet ears and the larvae destroy the flower stalks and seeds (Guèvremont 1981, Ndiaye, 1984, Bhatnager, 1984 cited by Baoua et al, 2013).

This caterpillar attacks millet when the candles are out and producers are hoping for a good harvest. It can destroy much or even all of the crop (photo left) (Madougou et al, 2018). Ear leaf miner moths appear one month after the first useful rains, i.e., those that allow for good planting (Madougou et al, 2018). Females lay their eggs at the top of the candles as soon as they are in flower (Madougou et al, 2018). After 3 or 4 days, the caterpillars emerge from the eggs and feed on the millet for a month. Then they fall to the ground, bury themselves, often deeply, and wait several months for the next rainy season (Madougou et al, 2018). When the rains return, they transform into moths and emerge from the soil to begin again (Madougou et al, 2018).

Biological control with the Habrobracon bee

Caterpillars have a formidable enemy, a small bee called Habrobracon in French. The female of this bee will lay her eggs on leaf miner caterpillars (Madougou et al, 2018). When the eggs hatch, the larvae of this wasp feed directly on the caterpillar (photo right) and kill it (Madougou et al, 2018). But naturally these wasps are not numerous enough to kill all caterpillars (Madougou et al, 2018). Therefore, they can be reared and then released into the fields around a village to increase their numbers and thus kill more leafminer caterpillars (Madougou et al, 2018). After rearing Habrobracon, put them in bags and then make releases containing these Habrobracon bees that producers can purchase to protect the fields on their land (Madougou et al, 2018).

Rearing process (the releases)

Habrobracon wasps will be introduced in buckets to lay eggs in the caterpillars (Madougou et al, 2018). Small 10 cm canvas bags, called release bags, will be made, containing some millet, two fertilized female Habrobracons and 25 *Corcyra* caterpillars (Madougou et al, 2018). Each bag will begin to release bees eight days after the bag is prepared (Madougou et al, 2018). On average 50-70 Habrobracon are released over a two week period (Madougou et al, 2018).

Bags are placed in the fields of a terroir; 15 bags per terroir. They are placed on 5 points in the center, north, east, south, and west of the village (Madougou et *al*, 2018). These 15 bags will suffice to protect the fields within a 5 km radius of the village (Madougou et *al*, 2018). The bags are placed under a shelter to protect them from the rain and sun, often a half 40-liter canister or a calabash. After this, the bees gradually emerge and go to attack the caterpillars that are on the millet ears (Madougou et *al*, 2018).

Characteristics of the technology

- Creation of employment at the community level, especially in village communities
- Easy and controllable by producers
- Environmentally friendly 2,362,850 ha treated in 2013-2014 with the support of the PPAAO in Niger

Bibliographic references

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