

Meadow-ploughing timing as an Integrated Pest Management tactic to prevent soil-pest damage to maize

Abstract

Has it ever happened to you?

It can happen that for years and years, you travel along the same road but, one day, it looks different; you notice something that you have never seen before: a tree or a house. This article reveals something that has always been there, something that will aid the Integrated Pest Management of soil pests but that we realize only now, after long, highly demanding research in fields / in the fields north-east Italy .

Highlights

- Soil-incorporated fresh meadow turf reduces wireworm attacks on maize.
- Soil-incorporated fresh meadow competes with crop early stages as a wireworm food.
- The timing of meadow ploughing is an IPM alternative to insecticides.

Abstract

The management of soil-pests still largely relies on conventional chemical insecticides despite the provisions of Integrated Pest Management (IPM). Long-term research was carried out in north-eastern Italy to assess the potential of meadow ploughing just before maize sowing to prevent wireworm damage. The research was based on the observation that no serious wireworm damage occurred in 20 years when meadows were ploughed just before maize sowing. The research hypothesis was that soil-incorporated fresh meadow turf would be a more attractive wireworm food source than seeds, emerging seedlings and young plants. Meadow plots with a sufficiently homogeneous wireworm density were alternately ploughed the previous autumn and a few days before maize sowing. The same conditions were simulated in pots into which known numbers of cage-reared wireworms had been introduced. Results showed very consistently that plant damage in plots ploughed just before maize sowing was much lower than the damage in plots ploughed in autumn-winter, and always below the economic risk threshold (15% of damaged plants). In controlled conditions, plant damage in pots with soil-incorporated fresh meadow turf was significantly lower than that observed in pots without. In both field and controlled conditions, this major effect on plant protection is likely to be caused by the incorporation of meadow turf living plant parts into the soil. Therefore, the ploughing timing of meadows in rotation may be a viable alternative to chemical insecticides when rotation includes meadow.

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