

Herbaceous Crop Bulletin (HCB): Integrated Plant Pathogen Management, IPM against wireworms and wild fauna – Reduction of synthetic chemical fungicide and insecticides use

GOALS

1. Meet Farm-to-Fork targets by implementing IPM principles (compulsory since 1 January 2014);
2. Reduce impact of pesticides (mainly fungicides and insecticides) on soil biodiversity;
3. Reduce impact of pesticides on the environment, particularly the water table.

Risk assessment performed as per Directive 128/2009/CE: evaluation of risk factors, monitoring with bait traps (Furlan 2014, Furlan *et al.* 2017).

PROTOCOL

Risk Assessment

Soil-pest monitoring by bait traps

Agronomic information

Crop: maize

Sowing date: 1 May 2025

Seed density: 7.61 seeds/m² (75 x 17.5 cm)

Hybrid: Kerubino (500)

Assessments

- drone images to count number of plants in each plot (experimental unit);
- counting of emerged and non-emerged plants on at least two 20 m x 4-row sub-plots randomly chosen from each plot to check drone data and pinpoint the causes of missing/damaged plants.

Outputs of the inspections:

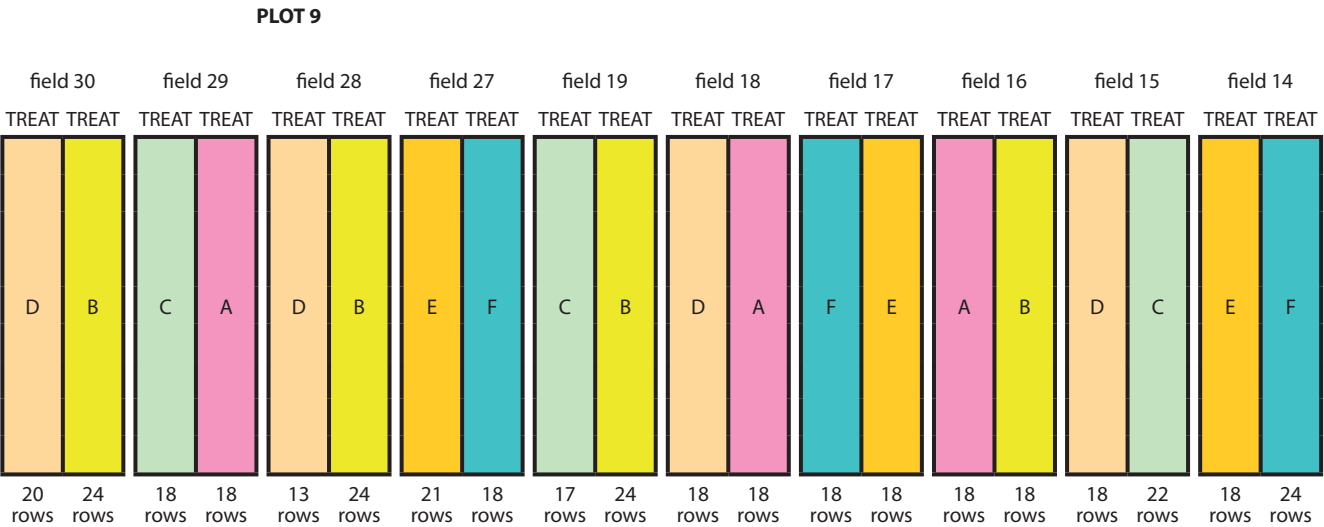
1. Healthy plants.
2. Damaged alive plants caused by pests/diseases (e.g. wireworms, blackcutworms, birds, plant diseases).
3. Damaged dead plants caused by pests/diseases.
4. Total plants.
5. Early vigor.
6. Yield maps.
7. Mycotoxin content.

TREATMENTS

- A) UNTREATED SEEDS
- B) SEEDS COATED WITH + CERTICOAT (ZN BASED-BIOSTIMULANT) and DENATONIUM BENZOATE (BIRD-repellent)
- C) SEEDS COATED AS PER 2 + CHEMICAL FUNGICIDE (REDIGO M)
- D) SEEDS COATED AS PER 2 + BIOLOGICAL "FUNGICIDE" TRICODERMA (TRIANUM 10 kg/ha) S IN-FURROW MICROGRANULAR
- E) SEEDS COATED AS PER 2 + TEFLUTRIN (FORCE CS 20 AS COATING)
- F) SEEDS COATED AS PER 2 + METHARIZIUM-BASED BIOLOGICAL INSECTICIDE (KLOZER G. 10 kg/ha) AS IN-FURROW MICRO-GRANULAR

PLOT LAYOUT

PLOT 8, fields 14 to 30. Randomized blocks – experimental unit: half a field (about 0.2–0.5 ha)



PLOT 7
NORTH

PLOT 7
NORTH

TREAT = TREATMENT

PREVIOUS RESULTS

Management of soil-pests and diseases relies largely on conventional insecticides. Within the framework of the EU’s PURE project, data were collected to assess the risk of soil-pest damage to grain maize in Europe in order to implement Integrated Pest Management (IPM) of soil-pests in a more practical and sustainable manner, thus reducing the use of soil insecticides, both in-furrow and as seed-dressing. Plant density and soil-pest damage to maize seeds and/or plants during the growing season were determined in fields with no or some risk factors in five European countries (Germany, Hungary, Italy, the Netherlands and Slovenia) from 2011 to 2014. A low risk of soil-pest damage to maize was found. In all fields, less than 5% of plants were damaged and no negative impact on yield was observed.

In the subsequent years, the results were exploited. All cultivated land on Vallevecchia farm has been farmed without the use of synthetic chemical insecticides since 2009 when IPM research began on Veneto Agricoltura pilot farms. No economic damage has been recorded. Each year, trials are carried out to disseminate IPM procedure and strategies to reduce the use of synthetic chemical fungicides. Trials to reduce the use of prophylactic seed-coatings are also being evaluated. In 2024, there was no difference in terms of crop stand and yield between plots treated with synthetic chemical insecticides and fungicides and untreated ones. In 2025, trials have been made public under the “Opens Farms-Open Protocols” approach and the results published, including an article in *Informatore Agrario*, a well-known Italian specialised agricultural journal.



Furlan L (2014) IPM thresholds for *Agriotes* wireworm species in maize in Southern Europe. *J Pest Sci*, 87 (4):609-617, DOI 10.1007/s10340-014-0583-5

Furlan L, Vasileiadis VP, Chiarini F, Huiting H, Leskovšek R, Razinger J, Holbe JI, Sartori E, Urek G, Verschweleg A, Benvegnù I, Sattin M. (2017) Risk assessment of soil-pest damage to grain maize in Europe within the framework of Integrated Pest Management. *Crop Protection*, 97: 52-59, doi.org/10.1016/j.cropro.2016.11.029

Furlan L, Chiarini F, Bolognesi S, Benetti M, Pasquali E, Fasolo A, Piotto S, Boscaro R, Compagnoni A, Mencari G, Codato F, Boato G (2024) Mais: gestire la difesa integrata per ridurre gli agrofarmaci. *L’Informatore Agrario*, 33, 52-56