

Wireworm (larvae of click beetles) bait traps – *Agriotes* spp.

Wireworms, the larvae of click beetles are up to 35 mm long. Their body is strongly chitinized, hard, from light brown to dark brown, has a wire-like appearance, and consists of 13 segments. They have 3 pairs of uniformly developed legs. Their head is well developed, flat, prognathic. The antennae have 3 segments, they protrude beside the mandibles. The mandibles are strongly chitinized, sickle-shaped.

Host plants of the wireworms include maize, cereals, sunflower, sugar-beet, potatoes, other grasses, and also many other plants, i.e. tomatoes. The larvae eat up hatching seeds and roots inside the soil. Damages are variable depending on the plant species attacked and the type of soil. Indicators can be of imperfect hatching of seedlings (maize), damaged hatchlings and roots, yellow colouring of the plant parts above ground, etc.



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The larvae, which are captured in the trap



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The damage of the larvae, which should be averted

The CSALOMON® [WW] wireworm bait trap should be put into the bare soil of fields 2-3 weeks before sowing, following closely the instructions in the assembling leaflet (sent attached to the trap; also available on our website www.csalomontraps.com). Beginning of trapping is determined both in the spring and in the autumn by the planned date of sowing, however, one should take into consideration that wireworms move actively in the soil (which affects the success of trapping) only **above 8 °C** soil temperature.

All accessories necessary are supplied with the trap, however, the natural attractant mixture should be added by the end user. For attractant mixture to serve 10 traps weigh **150 ml wheat seeds + 150 ml maize seeds + 1700 ml vermiculite**, mix them well and divide the mixture into the trap containers. For setting up the traps pls refer to the PDF downloadable from our website www.csalomontraps.com.

Selectivity of the CSALOMON® [WW] wireworm bait trap: the attractant mixture in the trap may attract besides wireworms also grubs of scarabs, and other soil dwelling insects which are attracted to carbon dioxide emanating from hatching seeds.

Longevity of the CSALOMON® [WW] wireworm trap: traps should be left out for at least 10 days (with soil temperatures above 8 °C), and then the contents of the catch containers should be inspected for the presence of wireworms. The old attractant mixture is not reusable, so replacing the trap after inspection is not advisable. In a given field plot at least **10 to 15 [WW]** traps should be applied, otherwise the mean catches will be unreliable^[1]

Control of wireworms should be based on the **combined** forecast using both **pheromone traps + wireworm bait traps**. Click beetle species occurring in the local area and their relative abundance can be determined by pheromone traps (available also from CSALOMON® – they catch only adult beetles), while actual population density, their developmental phase, etc. of wireworms can be determined by wireworm bait traps before sowing.

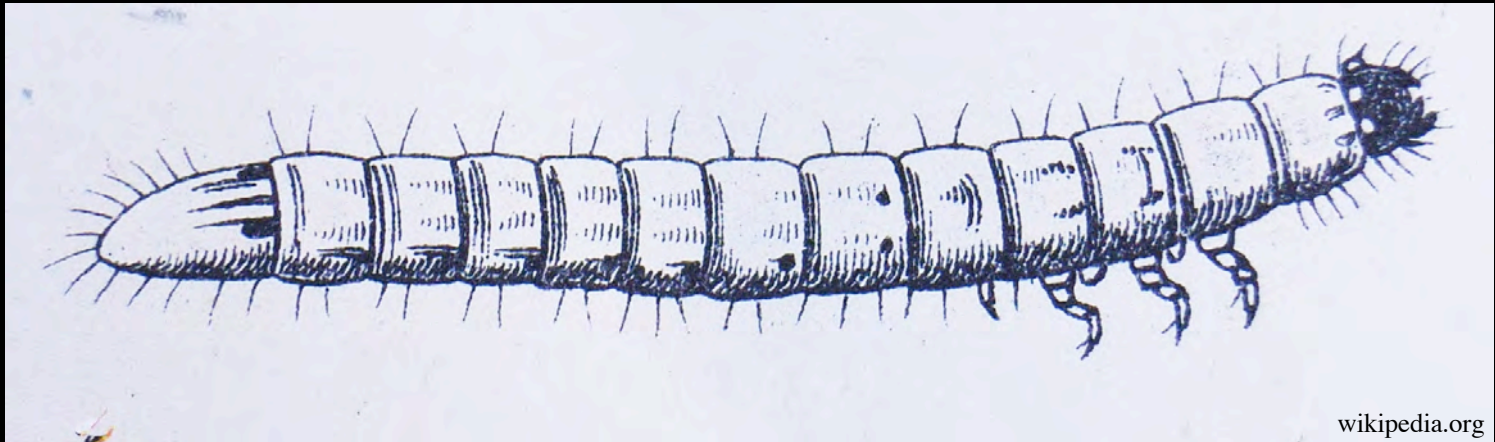
Both methods are suitable for decision making on control methods, however, combining the two will significantly increase certainty of decisions, and will save workload and costs, as in field plots where the pheromone traps of click beetles do not catch or catch insignificant numbers, it is not necessary to apply wireworm bait trapping. On the other hand, it may happen that in field plots, where large pheromone trap captures had been recorded, still it is not necessary to perform control measures provided that the catch of wireworm bait traps does not exceed threshold values.



According the experience in Italy if the yearly mean trap catch of *Agriotes ustulatus* beetles does not exceed 200-250 specimens, wireworm damage is highly improbable in the area in the next 2-3 years^[1]. In case of higher catches we strongly suggest wireworm bait trapping (which catches all *Agriotes* spp.), and in case of *A. ustulatus* a mean catch/trap value exceeding 5 wireworms/trap suggests a high probability of ensuing wireworm damage in the given field^[1]. The threshold in *A. brevis* seems to be at 1-2 wireworms / trap; thresholds for other species are being calculated. If catches exceed threshold values control measures become necessary, these can consist of rotation or the application of soil insecticides, etc.

Assistance for selecting pheromone traps: based on continent-wide pheromone trappings in Europe, *A. brevis* was found to be especially abundant in Italy and Austria, *A. lineatus* was present in almost all countries, *A. litigiosus* was most frequently found in Italy, *A. obscurus* in Switzerland, Germany some parts of France and the UK, *A. sordidus* in the west Mediterranean countries, *A. rufipalpis* in the east Mediterranean and Hungary, *A. sputator* in Western and Central Europe, and *A. ustulatus* in most countries of Western and Central Europe. Of course, the occurrence of local "hotspots" cannot be excluded.

^[1]Furlan, L. et al., ATTI Giorn.Fitopat. 1:133-140, 1996 and pers. comm.; ^[2]Furlan, L. et al., IOBC/wprs Bulletin Vol. 30:19, 2007.



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The wireworms eat up hatching seeds and roots inside the soil. Damages are variable depending on the plant species attacked and the type of soil. Indicators can be of imperfect hatching of seedlings (maize), damaged hatchlings and roots, yellow colouring of the plant parts above ground, etc.

The actual population density and the developmental phase of wireworms can be determined by wireworm bait traps before sowing. This method is suitable for decision making on control methods.





Foto: Jurkó V.

So it looks when caught in the CSALOMON® WW trap!