

Intercropping maize with barley to reduce wireworm damage

Problem

Find an alternative to neonicotinoids to avoid wireworm damage on maize.

Solution

Sowing barley with maize to concentrate wireworm attacks on barley (lure effect) instead of maize.

Outcome

When wireworm attacks are significant, the barley reduce the damage on maize plants from 12 to 82 % compared to the maize alone.

Applicability box

Geographical coverage

Temperate climate

Application period

Spring

Required time

2 tractor passes: one for sowing and one for destruction (spraying or hoeing)

Period of impact

From sowing to the 3-leaf stage

Equipment

Seeder able to for burying barley seeds more than 5 cm deep

Practical recommendations

- Farmers can use barley seeds from their previous harvest;
- Barley can be replaced by others cereals (wheat, oat, ...) but with higher risk of competition on maize;
- For better protection, lure crop must be sown the same day or a few days before maize;
- At least 100 kg.ha⁻¹ of lure seeds must be sown;
- Lure seeds must be sown deeper than the maize (at least 5cm with an optimum of 10-15 cm);
- Lure seeds must be sown neither too close nor too far from the maize rows (optimum of 20 cm) to avoid competition with maize and to facilitate the mechanical destruction of lure crop;
- Lure crop must absolutely be destroyed at the 3-leaf stage of the maize preferably mechanically (e.g.: hoeing).



Picture 1: Wireworm feeding on maize seed



Picture 2: Maize-barley intercrop in a field trial

Practical testing/Farmers' experiences

Intercropping barley with maize has been tested for 2 years by 21 "forward-looking" French farmers (conventional or organic), with the help of Terrena and Arvalis (ReMIX partners). Each of these farmers tested the crop mixture on one part of a field while the other part consisted of maize alone.





Further information

- Video on you Tube: <https://www.youtube.com/watch?v=oiYZXAhVxX0>
- Barsics, F., Delory, B.M., Delaplace, P. et al. (2017). Foraging wireworms are attracted to root-produced volatile aldehydes. *J Pest Sci* **90**, 69–76. <https://doi.org/10.1007/s10340-016-0734-y>
- La Forgia D., Verheggen F. (2019). Biological alternatives to pesticides to control wireworms (Coleoptera: Elateridae). *Agri Gene*, Volume 11. <https://doi.org/10.1016/j.aggene.2018.100080>
- Wiki: http://vm193-134.its.uni-kassel.de/En.DiversiWiki/index.php/Mixture_practice_for_farmers_and_advisors
- Check the [Organic Farm Knowledge Platform](#) for more practical recommendations.

About this abstract

Authors: Sophie Nicolleau¹, Florence Lievens¹, Alicia Dunay¹, Ludovic Patte¹, Bertrand Pinel¹, Anne-monique Bodilis²

¹ Coopérative Terrena, France, ² Arvalis Crop Institute, France

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ReMIX is a H2020 multi-actor project that will allow designing cropping systems based on agro-ecology for the benefit of farmers and the whole EU agricultural community. ReMIX will exploit the benefits of species mixtures to design more diversified and resilient agro-ecological arable cropping systems. Based on a multi-actor approach, ReMIX will produce new knowledge that is both scientifically credible and socially valuable in conventional and organic agriculture. The project will tackle practical questions and co-design ready-to-use practical solutions. The project will span from the specification of end-user needs and the co-design of in-field and on-farm experiments to demonstrations with evaluation of new varieties and practices. ReMIX will contribute to the adoption of productive and resilient agricultural systems. The project is running from May 2017 to April 2021

Website: www.remix-intercrops.eu

