



Increasing the efficiency and competitiveness of organic crop breeding

PRACTICE ABSTRACT No. 22

Screening buckwheat varieties for sustainable weed control

PROBLEMS:

In organic agriculture, one of the challenges for cultivation is the presence of weeds.

- Weeds can interfere with crop harvest and quality, as their presence can contaminate harvested agricultural products and increase the risk of spoilage or reduce market value.
- Weeds compete with crops for essential resources such as sunlight, water and nutrients, leading to reduced crop growth and yield.
- Weeds can serve as hosts for pests and diseases, increasing the risk of crop damage and spread of infections. Moreover, with the growing increase of sustainable agricultural systems, reducing/eliminating the use of herbicides is a priority due to endangering ecosystems, human health and water.
- Besides, the massive use of synthetic herbicides has led to an increase of resistant weeds, with weeds now becoming increasingly resistant to more than one family of synthetic herbicides.
- Synthetic chemical weed control is not an option in organic agriculture. Therefore, the development of alternative strategies for weed management is important.



Figure 1 Screening buckwheat varieties for allelopathic potential at UVIGO in Spain

SOLUTIONS:

- Plants naturally produce and release thousands of natural compounds into the environment, which can affect the germination and/or growth of surrounding plants. This phenomenon is known as allelopathy and can be found in natural as well as agricultural ecosystems.
- Some crops, such as buckwheat, produce these allelochemical compounds, which can be accumulated in plant tissues as a method of defense, or can be released into the environment affecting the development of surrounding weeds.
- Screening of different buckwheat varieties (Fig. 1) to identify those with a higher potential to control weeds can be an effective method of control in organic production systems and in addition, provides a sustainable alternative to synthetic chemical weed control in conventional agricultural systems.

PRACTICAL RECOMMENDATIONS:

- Allelopathy appears to work better against a single weed species than against several, but it has the potential to contribute to long-term weed control.
- Use buckwheat varieties with highest allelopathic potential against monocot and dicot weeds such as the buckwheat varieties Iwate zairai, Luba, Arihira zairai and Sveti Miklavz nad Litijo.
- Evaluate whether your buckwheat crop is being more affected by monocot or dicot weeds, as different buckwheat varieties show different potential to manage monocot and dicot weeds. Use Čebelica or Monori to manage monocot weeds, and Dozhdik and CD7272 to manage dicot weeds.
- Study in the field the associated adventitious flora and the seedbank history to select the best application method (mulching, cover crop, extracts, etc.) for target non-allelopathic crops.
- Selecting species with fast development for mulching or cover crops that are easy to find and cheap to establish.

FURTHER INFORMATION:

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ABOUT ECOBREED:

ECOBREED is a 5-year (2018-2023) project funded by European Union's Horizon 2020 research and innovation programme that will improve the availability of varieties and seed suitable for organic and low-input production. Activities will focus on four crop species i.e. wheat, potato, soybean and common buckwheat, selected for their potential contribution to increasing the competitiveness of the organic sector.

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