

Breeding an organic forage crop variety

Problems

In Switzerland and the EU, if available, organically bred varieties (e.g. Cat. 1 and 2 according to the classification developed by Bio-Suisse¹) should be preferred over conventional ones. However, only few organic forage crop varieties exist, and their seed availability is scarce. Breeders need to be encouraged to develop organic forage crop varieties.

Solutions



Figure: Alfalfa-grass mixture
(Photo: Agroscope)

Being courageous and define new breeding aims

Organic forages must compete well during establishment (no chemical weed control) and should efficiently utilize nutrient resources (no mineral fertilizer)². Quickly establishing stands of legume-grass mixtures are most appropriate, as they adequately suppress weeds and fix atmospheric nitrogen. In case of high legume ratios in the mixture, it is important to breed legumes with a low content of undesirable ingredients for animal nutrition, like phytoestrogens. For best performing mixtures, it is important to select the components directly together in order to maximize positive interactions for yield, nutritional quality, etc. One example is the selection of spaced alfalfa plants in an under-sowing with tall- and red-fescue (see Figure).

Practical recommendations

- Start an organic breeding program in your target selection environment, collect information about organic certified areas including their “cultivation history” (e.g. weed infestation from previous years)
- Mimic future cultivation system in the nursery, e.g. by combining spaced plants of target species by under-sowing with the right companion species³
- Do preventive measures for avoidance against pests and weeds in advance, e.g. reduce seed stock of weeds via repeated hoeing
- Identify important traits (e.g. early vigour to enhance weed suppression) for organic cultivation and put special focus on them in your selection²

Further information

1. [Standards for the Production, Processing and Trade of 'Bud' Products](#)
2. Crespo-Herrera L.A and Ortiz R. Plant breeding for organic agriculture: something new? [Agriculture and Food Security](#) 4 (25): 1-7.
3. Sanderson M.A., Brink G., Ruth L. and Stout R. 2012. Grass–Legume Mixtures Suppress Weeds during Establishment Better than Monocultures. *Agronomy Journal* 104 (1): 36-42.

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LIVESEED: Boosting organic seed and plant breeding across Europe. LIVESEED is based on the concept that cultivars adapted to organic systems are key for realising the full potential of organic agriculture in Europe. Research project 2017-2021.

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