

Organic lentil production in Switzerland – agronomic and qualitative sensory investigations

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Graphic 1 Seeds of the investigated lentil genotypes; snowflakes indicate winter hardy types.

Background

Lentils offer several benefits for sustainable agricultural systems, are climate smart and are a valuable crop to address the increasing demand for plant-based protein food. In Switzerland, the demand also increased and since a lot of lentils are imported, the cultivation of lentils in Switzerland would be an interesting niche, particularly in organic farming.

Material and methods

- Field experiments (seeding density, different lentil genotypes) in the proximity of Zurich between 2015 and 2019 in two growing seasons (fall and spring).
- Sensory analysis has been carried out with 10 trained panelists and 12 selected genotypes (Graphic 1).

Results

Seeding time

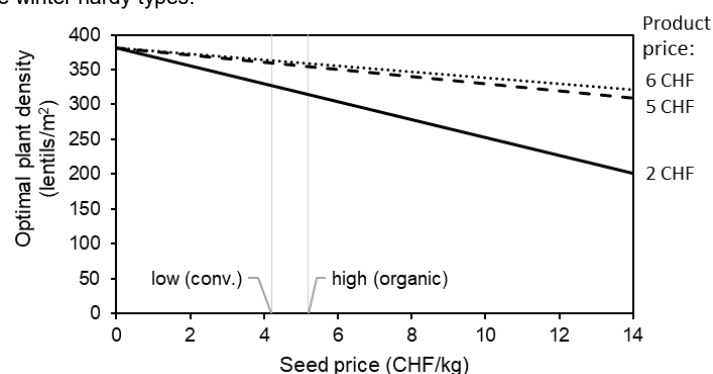
- Promising yields (2.2 t/ha) were achieved with the existing and not true winter hardy lentil types sown in autumn (Table 1).
- Anthesis was earlier compared with spring-sown lentils → helps to secure yield in water stressed conditions

Plant density

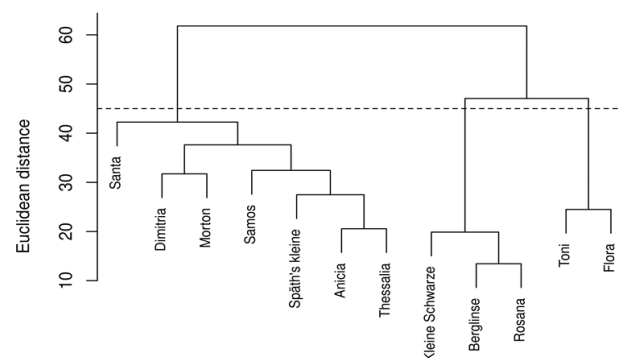
- Optimal plant densities are around 180 – 240 plants per square meter.
- Economic perspective: sowing density can be increased, as the additional costs for the seed are offset by the higher yield (Graphic 2).

Sensory analysis

- Sensory analyses revealed significant differences in mealiness and juiciness between tested genotypes.
- Three clusters were identified that differed in their sensory characteristics (Graphic 3).



Graphic 2 Economically optimal sowing density (lentils/m²) in dependence on price of the seeds (CHF/kg) and the producer price of 2, 5, and 6 CHF/kg lentils.



Graphic 3 Sensory similarities between lentil genotypes. Dendrogram for the cluster analysis of non-standardised sensory descriptors. The dashed horizontal line represents the defined cut-off used to separate the three clusters.

Conclusion

To enhance Swiss lentil production, autumn-sowing would offer more possibilities for higher yields and including them in Swiss crop rotations, while meeting the demand of consumers for locally produced food. Since little differences with the sensory analyses were observed, genotypes could be chosen according to desired colour and seed size and based on their agronomic properties, adaptation to climate conditions and winter hardiness.

Table 1 Grain yield (t/ha) standardised to 8 % moisture of 12 different lentil genotypes in dependence on sowing dates (autumn and spring) and years (2015-2017) in the proximity of Zurich (CH).

	2015	2016	2017
autumn-sown	1.6	0.2	2.2
spring-sown	1.2	0.0	1.7