



'Frau Rotacher' and 'Gartenmeister Simon' in the Öpfelgärtli - an educational arboretum to promote the sustainable cultivation of historic apple varieties in the Alemannic-speaking areas of Baden-Württemberg, Alsace and North Switzerland

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Key Thoughts

- Why is horticulture-research on apples useful for narrative science communication?
- Because apple varieties are meaningful representations of cultural identity and it is a familiar and everyday object - it is intellectually comfortable to learn new aspects in this didactic context!

Apple varieties are part of our cultural history and thus contemporary witnesses of a cultural identity. Regional identity, the concept of homeland, is shaped by narratives that characterise a certain regional self-view.

The historical development of varieties is influenced to both: regional environmental conditions and preferences regarding the use of apple varieties. Therefore the varieties reflects images of the times, cultural themes and preferences. It is this specific meaning that makes apples seem particularly suitable to symbolize the narrative of a social culture.

This project develops a non-formal narration-based public environmental education for adults. The target group is identified as small farmers, owners of allotment gardens, responsible persons in public institutions which set up public gardens. On the other hand consumers interested in healthy eating are target group too.

Summarized research questions

- What knowledge and recommendations about regional apple varieties can be found? Are genetic resources available?
- Which varieties have a high health value? How high is the polyphenol content? Are there allergy friendly apples?
- Which varieties can be described as robust and stress-resistant?
- Which of the old apple varieties have a high correspondence with consumers' purchasing preferences? Which of the preferences / variety attributes are particularly decisive for purchase?
- How is Öpfelgärtli and its didactic concept evaluated by the target groups? Which meanings (epistemologies) do the target groups show in relation to the topic?

Project duration: April 2019 - March 2023
 Number of varieties: 120 historic and 20 modern varieties for comparison analysis, 500 trees
 Research-gardens: 4 topographical different areas of 1000m² each and 4000m² for the permanent arboretum self-funded PhD-Project
 Character:

Research Design

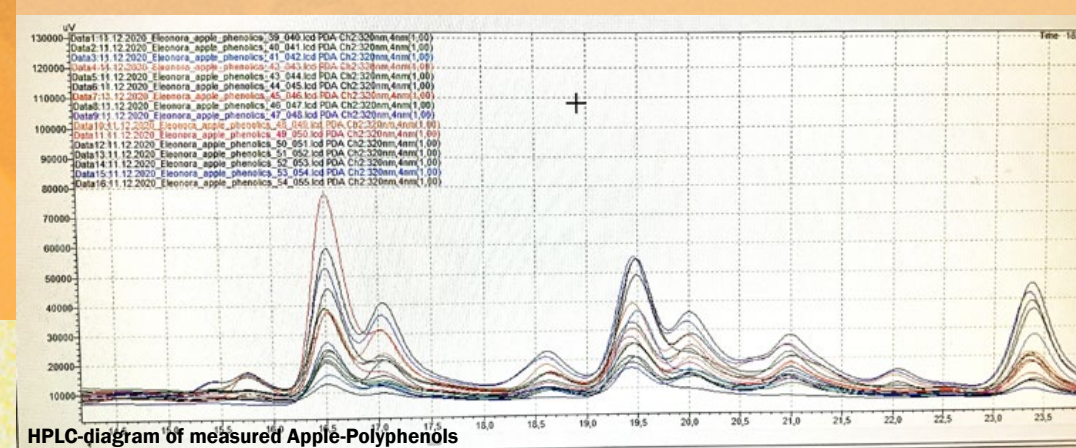
Based on the research questions the project contains five steps of research – from the development of knowledge on the subject area up to the exemplary conception, implementation and evaluation of the didactic concept.

This creates a major challenge for the methodical research design. **The integrative research strategy is using a mixed-methods approach.**

By sequencing five research steps, the multi-level knowledge base is created in order to develop a concept to establish the public arboretum, the Öpfelgärtli (Alemannic for 'apple garden'). The Öpfelgärtli also has a virtual presence in the form of an accompanying website with spoken podcasts of narrations.

Five steps of research

- 1. Exploratory study:** identification of regional apple varieties and their history. Identification of corresponding central historical and social topics of the Alemannic language area.
- 2. Monitoring** and classification: stress- and disease resistance of the apple trees
- 3. Laboratory analysis:** health value of apples, indicator polyphenols, categorization of allergenicity
- 4. Acceptance study:** Conjoint analysis of apple consumers' fruit preferences
- 5. Evaluation:** didactic concept of the Öpfelgärtli and epistemological knowledge



Targeted results

Historical facts about regional apple varieties and the history of the Alemannic language area were compiled in 2019. From this, the initial framework story for the narrations was created in 2020. In addition, a 'Christian Narrative Garden' was realized with 30 trees as an experimental garden on the sub-theme of Christianity.

Each apple variety is represented by 3 specimens in the research gardens. These cover the geographical conditions of the region: from the warm valley location along the Rhine to the high altitude in the Black Forest. In this way, the suitability of the varieties for growing areas can be explored. 4 years project time is short for monitoring, but first results and trends can be summarized towards end of the project 2023.

The health value is evaluated. In addition to the usual characteristic values such as sugar content, the focus is on measuring the content of 27 polyphenols and determining the suitability of a variety for apple allergy sufferers. This analysis was completed at the begin of 2021 and yielded astonishing results on the very large differences between the varieties.

Conjoint analysis as method in market research is a decompositional procedure that estimates the structure of consumers' preferences by drawing on their overall judgments about a set of alternatives specified by expressions of various attributes. Here, the product characteristics of the varieties are evaluated and brought into a decision sequence. The analysis is planned for spring 2022.

Epistemological beliefs are a person's assumptions about the origin, certainty, structure, and justification of knowledge. Sophisticated epistemologies are necessary to assess complex information. It is insightful not to ask in an evaluation what kind of declarative knowledge has been retained. It is more important to find out what cognitive resources have been activated and how attitudes have changed. After all, the goal is to initiate environmentally friendly and health-promoting actions and not to store inert knowledge. Planned for winter 2022.

Application in the Arboretum

Summarized example for implementation of the acquired knowledge in the arboretum: *Imagine you are a resident of the geographical area of the Alemannic dialect, and you would think about which apple variety you would like to plant that will suit you and your regional homeland. Perhaps the **Christkindler** is the fitting variety*

About 500 years ago, the Alemanni ancestors in Alsace invented the tradition of the Christmas tree. In 1521, red apples are first mentioned as Christmas tree decorations for Schlettstadt. These apples were the symbol of original sin and hoped-for return to paradise: the pale green part of the fruit reminds of the color of corpses and the purple part of forgiveness and eternal life. After Christmas, the apples were then given to the poor for food. Since 1600 the local Christkindler (*christmas child-apple*) variety established itself as a pretty, durable and delicious christmas apple - until it was almost completely displaced by glass Christmas tree baubles.

The Christkindler belongs to the robust tree varieties, suitable for ecological cultivation, and also grow at high altitudes. It grows well as a bush tree or half trunk and has a vigorous growth, so it needs regular pruning. It tends to alternate, so you can only expect a good harvest every two years. The apples are ripe for consumption from November to spring, for storage a cool cellar is sufficient.

The apples are small, purple-red, sourly sweet, juicy, slightly perfumed. The sugar content of 9.6 g/100g is slightly below average - the fructose content is significantly below average, so that diabetics and fructose intolerant people can also eat him well. The high content of polyphenols, especially quercetin, brings protection against various diseases, such as cancer. Apple allergy sufferers tolerate the Christkindler. "One apple a day keeps the doctor away" is especially true for this variety.

Consumers rate this apple as tasty, spicy and pretty. It is described as crisp and juicy, some find the skin a bit too firm. Because of its rather small size, it is also prized as a children's apple – although children would sometimes like an apple that is a bit sweeter, here the Christkindler loses out to modern varieties with a similar appearance, such as the Topaz. For their own gardens, many would not plant a winter apple due to the lack of adequate storage facilities in modern houses. But because of its local history, it is still popular for planting when there is room for several apple trees.

