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de la formation et de la recherche DEFR

Agroscope

Zea mays L. *in the Swiss Genebank*

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History of maize in Switzerland

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History of maize in Switzerland

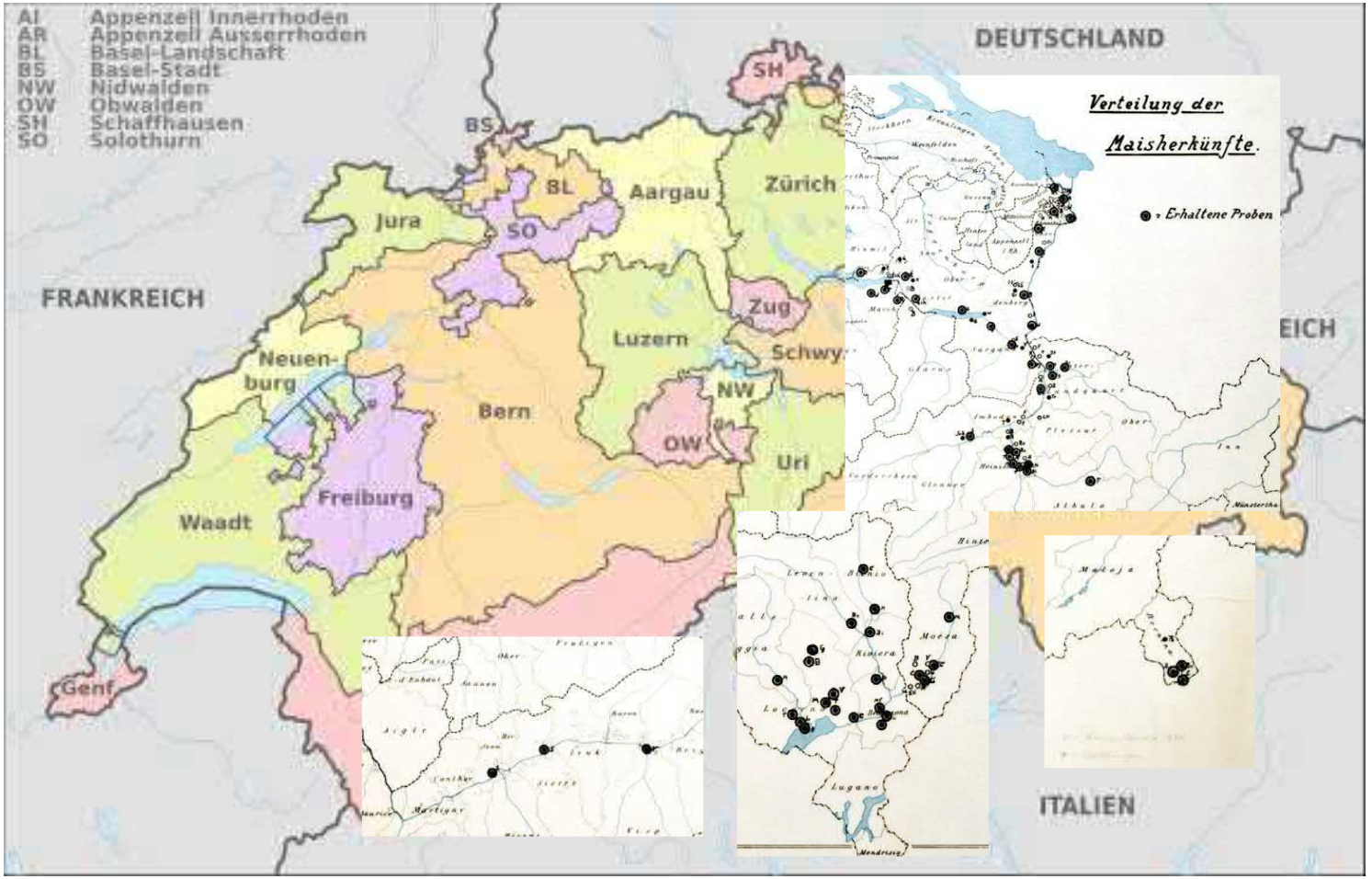
Albert Volkart (1905):

- *Kanton Tessin (2800 ha)*
- *Wallis (100 ha)*
- *Rhinevalley and Linth (1000 ha)*
- *Bündner Rheintale bis Thusis (250 ha)*

Utilization:

- *Polenta in the south*
- *Ribel: in the Rhinvalley*
- *Bread, in mixture with*
  Rye-flour

History of maize in Switzerland



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History of maize in Switzerland

Dr. Siegfried Wagner collected more than 100 loacal varieties (1941 – 1942) and classified them in :

- *Doml e s c h g e r* Maize, yellow, 8-rows
- Small *Rh e i n t a l e r* Maize, white, and a little slightly earlier than
- Big *Rh e i n t a l e r* Maize, white, 12-rows,
- *S t . Ga l l e r Ob e r l ä n d e r* Maize, white and slightly later than the big Rheintaler, 12 - rows.

Local varieties collected in the 60 in Domleschg

National Genebank of Switzerland

Historical background :

- 1571 first mention of maize in the Rhine-Valley
- 1941-1942: 106 accessions were collected and intergrated into the Genebank
- 1960: 43 accessions from the Graubünden and Wallis
- 2000 – 2019: 76 accessions from the Wallis, Tessin, Rhinvalley and Linth

- **Today** : 209 local varieties were conserved in the Swiss Genebank

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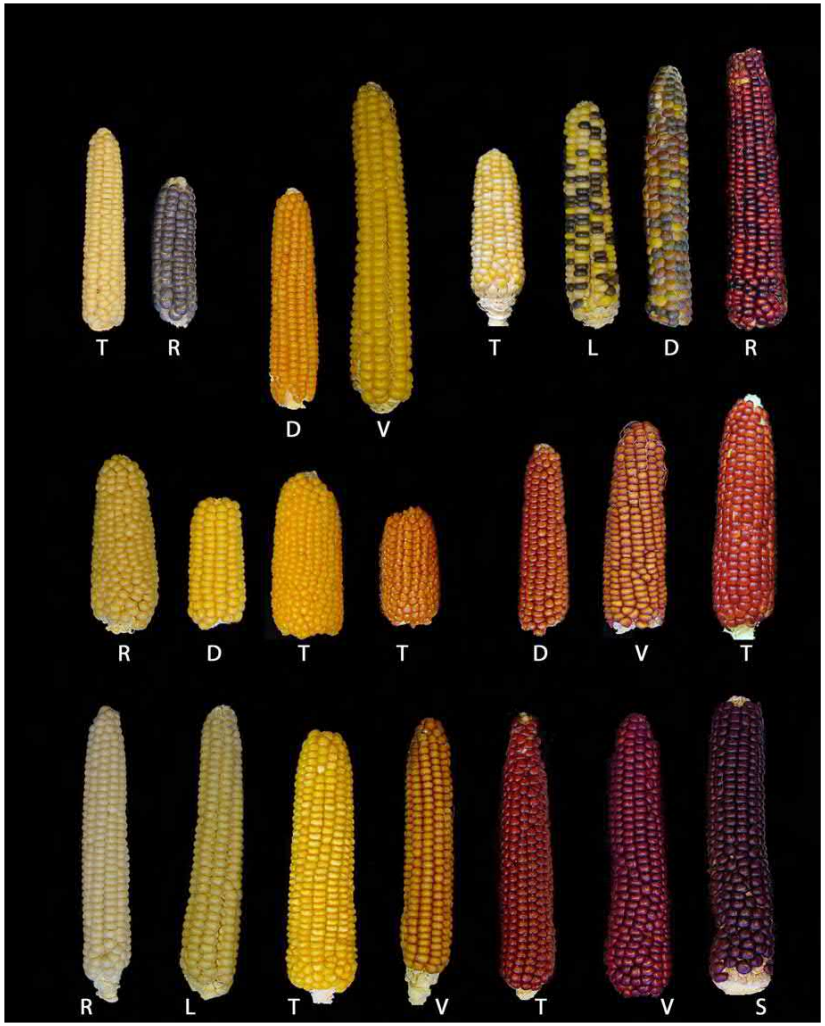
Local varieties of maize in Switzerland



Important selection factors are:
- the duration of the growing season
- drought, diseases and pests.

But the natural selection is joined by selection by human beings:
- preferences for certain forms and colours or culinary characteristics.

D: Domleschg
L: Linthtal
R: Rheintal
S: Sagogn, Vorderrheintal
T: Tessin
V: Wallis.

Linthmais : ZM156

Local varieties of maize in Switzerland

Ribelmais – success story

Challenges of local varieties

- **Climate change** :
  - new diseases
  - higher diseases pressure
- **Soil fertility**:
  - lodging
  - yeald expectations
- **Food legislation**
  - limits for mycotoxin
- **Lack of knowledge**
  - about selection of population varieties

→ University of Hohenheim with Prof. Dr. Karl Schmid

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Evaluation of the local varieties

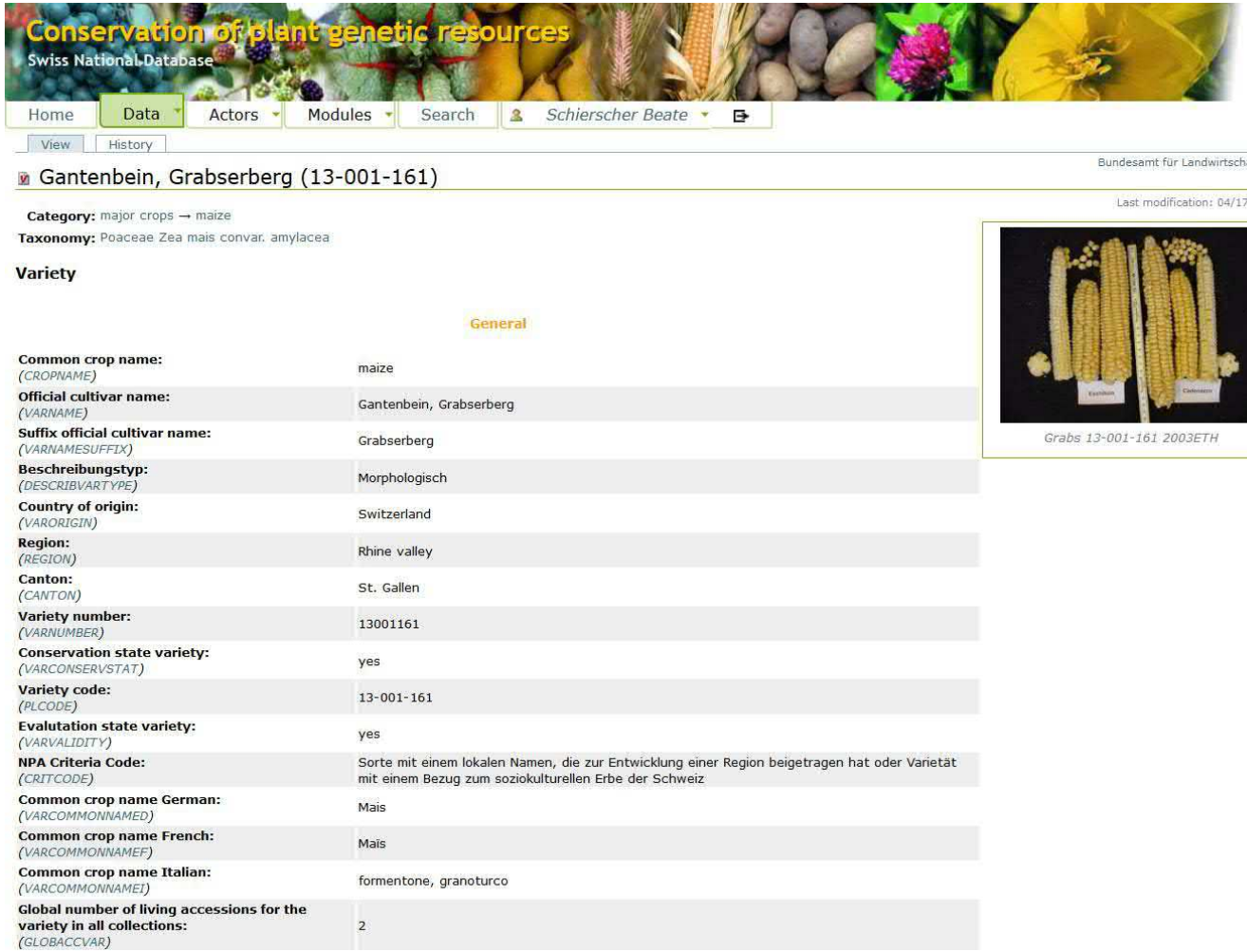
- Local varieties show in general a good early vigour under cool condition:

- « Broad variation for important early vigour traits was decovered under controlled cool as well as under field concitions and landraces accessions frequently exceeded even the vigours hybrid. »

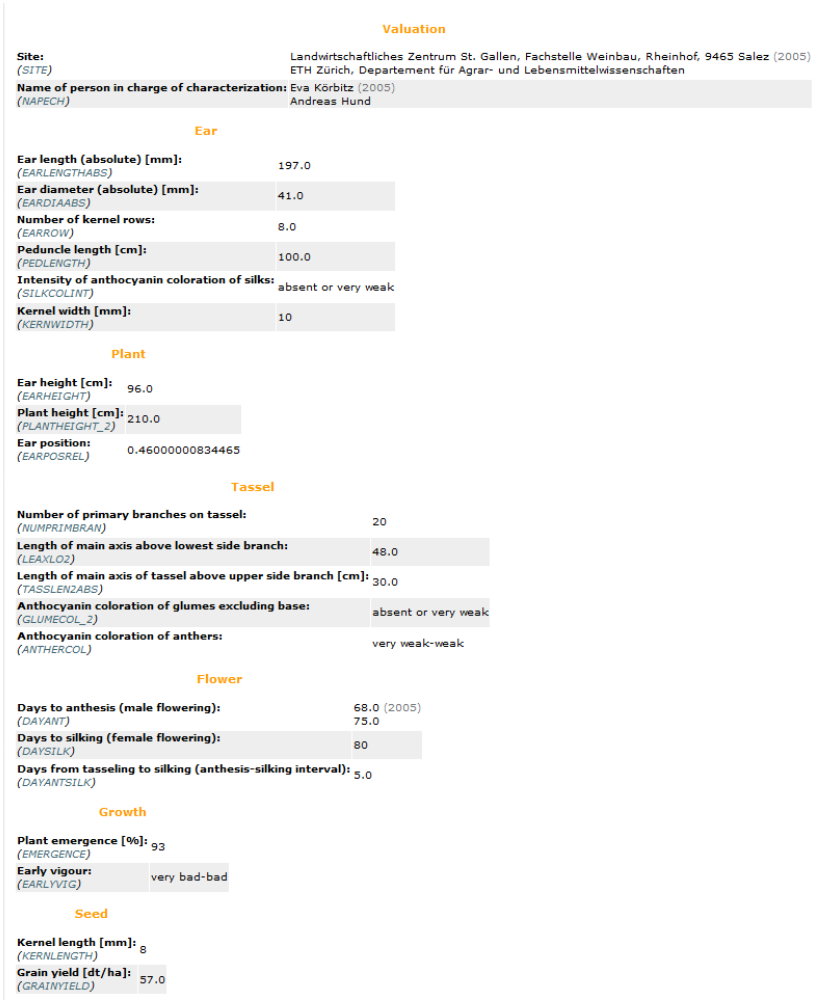
Peter, Roland (2007): Early vigour of Swiss Maize landraces (Zea mays L.) in cool environments. Agronomic performance and root characteristics. Dissertation. Zürich (Diss. ETH, 17398)

Ribelmaize from the Rhine Valley

Documentation on: www.bdn.ch



Documentation on: www.bdn.ch



Valuation

Site: *(SITE)*	Landwirtschaftliches Zentrum St. Gallen, Fachstelle Weinbau, Rheinhof, 9465 Salez (2005) ETH Zürich, Departement für Agrar- und Lebensmittelwissenschaften
Name of person in charge of characterization: *(NAPECH)*	Eva Körbitz (2005) Andreas Hund

Ear

Ear length (absolute) [mm]: *(EARLENGTHABS)*	197.0
Ear diameter (absolute) [mm]: *(EARDIAABS)*	41.0
Number of kernel rows: *(EARROW)*	8.0
Peduncle length [cm]: *(PEDLENGTH)*	100.0
Intensity of anthocyanin coloration of silks: *(SILKCOLINT)*	absent or very weak
Kernel width [mm]: *(KERNWIDTH)*	10

Plant

Ear height [cm]: *(EARHEIGHT)*	96.0
Plant height [cm]: *(PLANTHEIGHT_2)*	210.0
Ear position: *(EARPOSREL)*	0.46000000834465

Tassel

Number of primary branches on tassel: *(NUMPRIMBRAN)*	20
Length of main axis above lowest side branch: *(LEAXLO2)*	48.0
Length of main axis of tassel above upper side branch [cm]: *(TASSLEN2ABS)*	30.0
Anthocyanin coloration of glumes excluding base: *(GLUMECOL_2)*	absent or very weak
Anthocyanin coloration of anthers: *(ANTHERCOL)*	very weak-weak

Flower

Days to anthesis (male flowering): *(DAYANT)*	68.0 (2005) 75.0
Days to silking (female flowering): *(DAYSILK)*	80
Days from tasseling to silking (anthesis-silking interval): *(DAYANTSILK)*	5.0

Growth

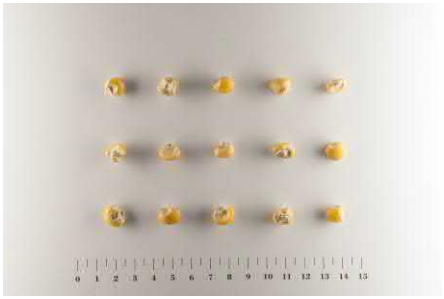
Plant emergence [%]: *(EMERGENCE)*	93
Early vigour: *(EARLYVIG)*	very bad-bad

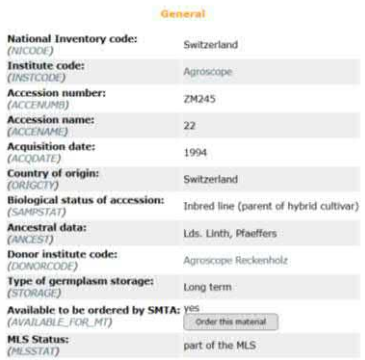
Seed

Kernel length [mm]: *(KERNLENGTH)*	8
Grain yield [dt/ha]: *(GRAINYIELD)*	57.0

National Genebank of Switzerland

- 1930 : start of a maize breeding programme in Switzerland, separate selection for silage maize and grain maize
- 1950 : first results: a improved Maize out of a local variety
- Developped inbred lines out of the Linthmais, but also of the Rhine Valley and Graubünden





229 accessions Inbred lines (parent of hybrid cultivar)

National Genebank of Switzerland

- 1946 : first hybrid crossing experiments
- 1955 : first Swiss hybrid «Orla266» (Inbred lines of Rheintaler x Wisconsin 255)
- 1994/5 : privatisation of the maize breeding programme

ZM244 -

ZM281 -

Security storage

Thank you for your attention

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