



Schweizerische Eidgenossenschaft
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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





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

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

- *Domleschger* Maize, yellow, 8-rows
- Small *Rheintaler* Maize, white, and a little slightly earlier than
- Big *Rheintaler* Maize, white, 12-rows,
- *St. Galler Oberländer* Maize, white and slightly later than the big Rheintaler, 12 - rows.



Local varieties collected in the 60 in Domleschg



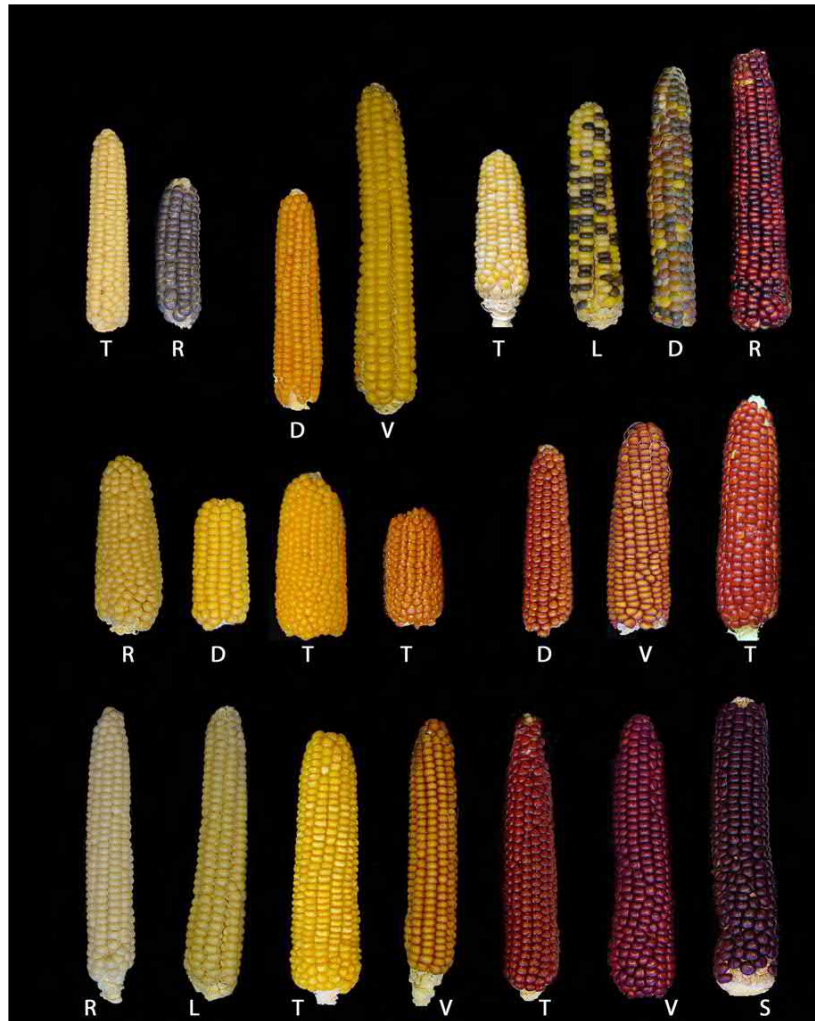
National Genebank of Switzerland

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



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





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 discovered under controlled cool as well as under field conditions and landraces accessions frequently exceeded even the vigours hybrid. »

Ribelmaize from the Rhine Valley



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)



Documentation on: www.bdn.ch

Conservation of plant genetic resources
Swiss National Database

Home Data Actors Modules Search Schierscher Beate

View History

Gantenbein, Grabserberg (13-001-161) Bundesamt für Landwirtschaft B...
Last modification: 04/17/2014

Category: major crops → maize
Taxonomy: Poaceae Zea mais convar. amylacea

Variety

General

Common crop name: (CROPNAME)	maize
Official cultivar name: (VARNAME)	Gantenbein, Grabserberg
Suffix official cultivar name: (VARNAMESUFFIX)	Grabserberg
Beschreibungstyp: (DESCRIBVARTYPE)	Morphologisch
Country of origin: (VARORIGIN)	Switzerland
Region: (REGION)	Rhine valley
Canton: (CANTON)	St. Gallen
Variety number: (VARNUMBER)	13001161
Conservation state variety: (VARCONSERVSTAT)	yes
Variety code: (PLCODE)	13-001-161
Evaluation state variety: (VARVALIDITY)	yes
NPA Criteria Code: (CRITCODE)	Sorte mit einem lokalen Namen, die zur Entwicklung einer Region beigetragen hat oder Varietät mit einem Bezug zum soziokulturellen Erbe der Schweiz
Common crop name German: (VARCOMMONNAMED)	Mais
Common crop name French: (VARCOMMONNAMEF)	Mais
Common crop name Italian: (VARCOMMONNAMEI)	formentone, granoturco
Global number of living accessions for the variety in all collections: (GLOBACCVAR)	2

Grabs 13-001-161 2003ETH



Documentation on: www.bdn.ch

Valuation	
Sites (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] (TASSELEN2ABS)	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 (EARLYVTG)	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
- Developed inbred lines out of the Linthmais, but also of the Rhine Valley and Graubünden



General	
National inventory code: (NICOD)	Switzerland
Institute code: (INSTCODE)	Agroscope
Accession number: (ACCNUMB)	ZM245
Accession name: (ACCNAME)	22
Acquisition date: (ACQDATE)	1994
Country of origin: (ORIGCTY)	Switzerland
Biological status of accession: (BIOPSTAT)	Inbred line (parent of hybrid cultivar)
Ancestral data: (ANCEST)	Lds. Linth, Pfäfers
Donor institute code: (DONORCODE)	Agroscope Reckenholz
Type of germplasm storage: (STORAGE)	Long term
Available to be ordered by SMTA: (AVAILABLE_FOR_M)	YES <input type="button" value="Order this material"/>
MLS Status: (MLSTAT)	part of the MLS

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

