

# About ~600 wheat cultivars in a poster Exchanges of genetic resources between breeders in the early XXth century

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TABLEAU GENEALOGIQUE  
de six cents variétés de blés

dressé par F. Flandrin, Ingénieur Agronome, Chef des  
Services Régionaux de l'O.N.I.C.

L'origine généalogique des variétés est indiquée par les flèches qui  
aboutissent par leurs pointes aux variétés hybrides.

Les petits cercles ne comportant pas de nom de variété représentent des  
hybrides intermédiaires qui n'ont pas été mis au commerce.

Lorsqu'une seule flèche aboutit à une variété cela indique que la variété  
considérée provient d'une amélioration ou d'une mutation de la variété de  
laquelle est issue la flèche.



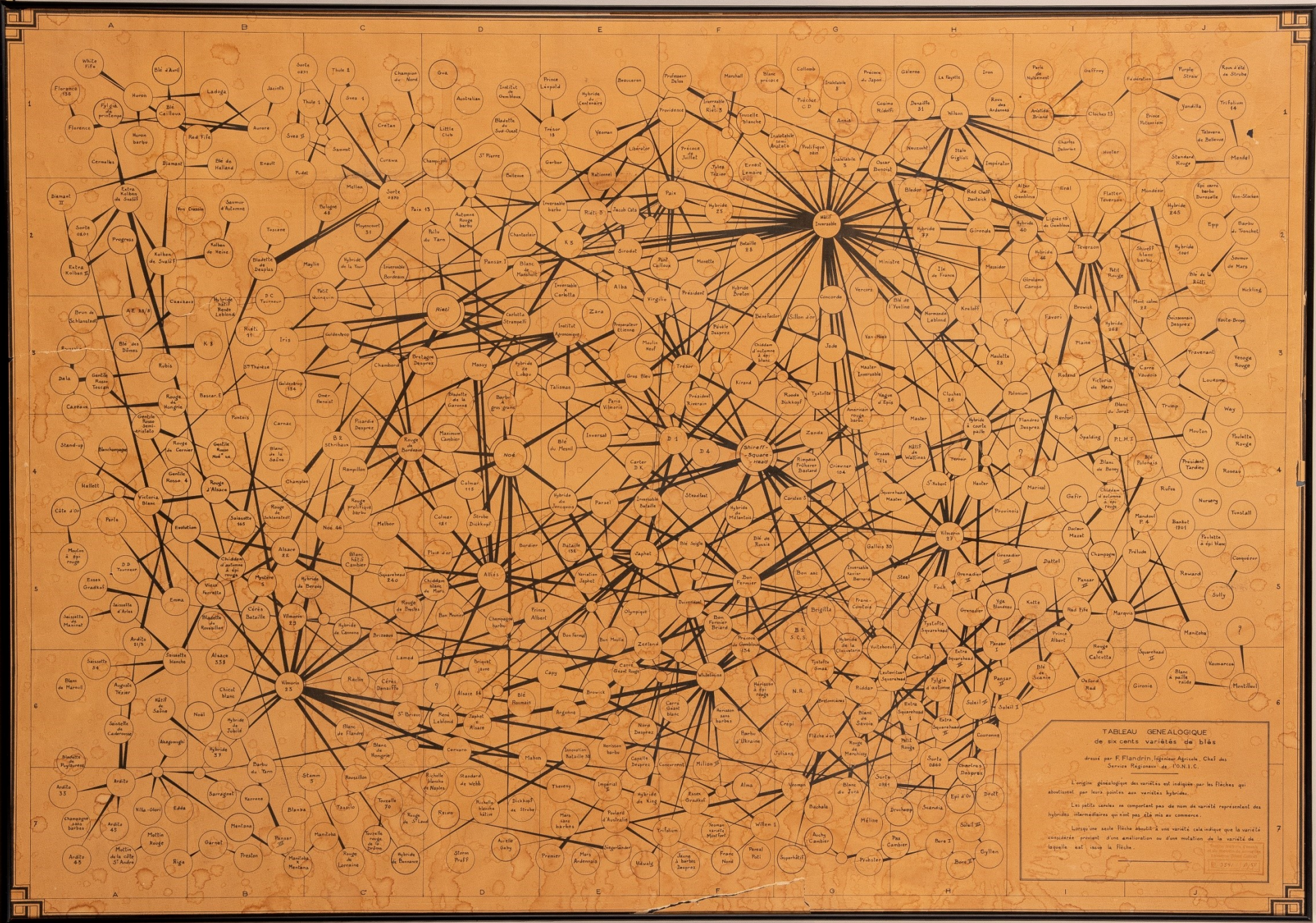
# Introduction

Some years ago I discover a small booklet (125p.) called :

«Les Blés de Semence»

by F. Flandrin (Chef des Services Régionaux de l'O.N.I.C) and an old **poster** with more than 550 wheat and their pedigree.

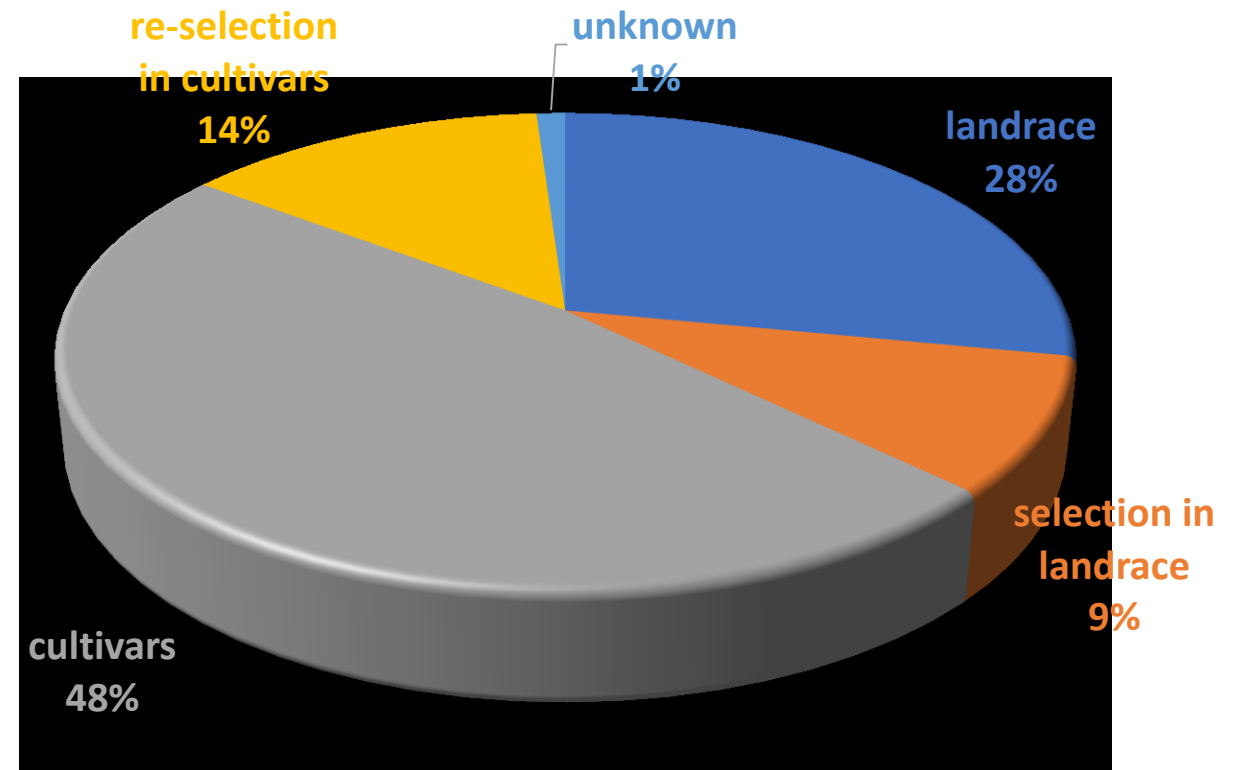
They were both published in 1949 in France and they give an impressive view of the huge exchange of genetic resources between breeders at the beginning of XXth century.





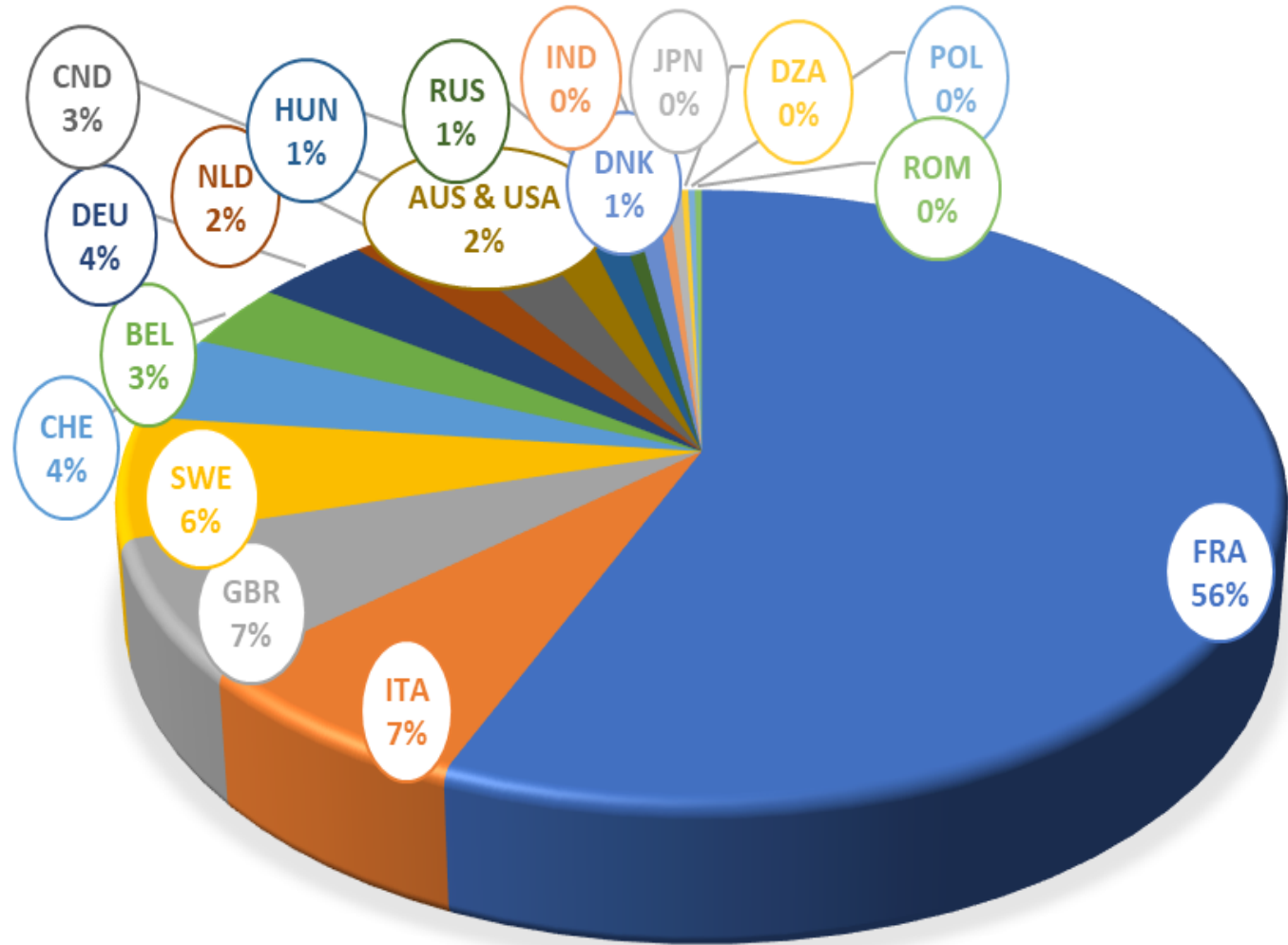
# Accessions

- 566 dots representing **556 wheat cultivars**  
(10 accessions are twice on the poster)
- 156 landraces
- 51 selection in landraces
- 267 cultivars (from crosses)
- 76 re-selection in cultivars
- 6 unknown



# By country

country	nb acc.
FRA	263
ITA	34
GBR	32
SWE	30
CHE	21
BEL	16
DEU	17
NLD	11
CND	14
AUS & USA	9
HUN	5
RUS & UKR	3
DNK	4
IND	2
JPN	2
DZA (Algérie)	1
POL	2
ROM	1
unknown	106



# In Genbank (506 acc. with an univocal denomination)

Genebank	Nb Accessions	% cultivars
Germany (IPK)	341	~67%
France (CRB)	305	~60%
Russia (NI Vavilov)	216	~43%
Switzerland (Agroscope)	161	~32%
Mexico (CIMMYT)	72	~14%
<b>TOTAL</b>	<b>402</b>	<b>~79%</b>



# Beginning of modern breeding (based on World Wheat Book, Volume 3)

Year	Country	Breeder or location
<b>EUROPE</b>		
1790	GBR	Knight, first know crosses of wheat
<b>1856</b>	<b>France</b>	<b>L. de Vilmorin</b>
<b>1860</b>	<b>Poland</b>	<b>Peplowski</b>
<b>1865</b>	<b>Hungary</b>	<b>Mokry and Szilvay</b>
<b>1873</b>	<b>GBR</b>	<b>Sheriff</b>
<b>1875</b>	<b>Germany</b>	<b>Rimpau</b>
<b>1886</b>	<b>Netherland</b>	<b>Broekema</b>
<b>1886</b>	<b>Sweden</b>	<b>von Neergard Gyllenkrok and Welinder</b>
<b>1898</b>	<b>Switzerland</b>	<b>Martinet</b>
<b>1900</b>	<b>Italy</b>	<b>Strampelli</b>
1901	Austria	Tschermark
1904	Ireland	Dublin
<b>1910</b>	<b>Russia</b>	<b>Rudzinski</b>
1911	Bulgaria	Ivanov
<b>1912</b>	<b>Ukraina</b>	<b>Sagepin and Yuryev</b>
1913	Norway	Vik
<b>1914</b>	<b>Romania</b>	<b>Ionescu-Sisesti</b>

Year	Country	Breeder or location
<b>ASIA</b>		
<b>1893</b>	<b>Japan</b>	<b>Tokyo</b>
<b>1904</b>	<b>India</b>	<b>Howard and Howard</b>
1910	Korea	Suwon
1914	China	Reisner
1925	Turkey	Eskisehir
1933	Iran	Varamin Institute

<b>AFRICA</b>		
1902	South Africa	Neetling
1907	Kenya	Delamere and Evans
1920	Morocco	
1923	Tunisia	

Year	Country	Breeder or location
<b>NORTH AMERICA</b>		
1877	USA	Vermont
1887	Canada	Saunders

<b>MID AND SOUTH AMERICA</b>		
1912	Argentina	Backhouse
1937	Brazil	Camoinas
1945	Mexico	Borlaug

<b>AUSTRALIA-PACIFIC</b>		
<b>1889</b>	<b>Australia</b>	<b>Farrer</b>
1920	NZL	Canterbury



# Breeders in this poster

65 Breeders. Today : 16 in breeding or seed sector, but only 9 are really still wheat breeders

Country	Breeder (or location)	Breeder (or location)
France	Alliot	Lafite
	Bataille	Lasserre
	Belloy	Legland
	<b>Benoist</b>	<b>Lemaire</b>
	Blondeau	M. Maylin
	Bonte	M. Rabaté
	Bormans	<b>Maison Florimond Desprez</b>
	Bretignières	Maisse,UGA
	C. de Carbonnières	Mandoul
	Cambier	Nicolas
	Cazeaux	P.Genay
	Coop. De Brie	Parisot
	Crépin	Prof Schribaux
	Denaiffe	René Leblond
	Dromigny et Hamel	<b>St.Clermont / INRAe</b>
	Ets Georges Laurent	St.Dijon / INRAe
	Ets Tourneur Frères	St.Waningen
	Fernand Lepeuple	Sta.Colmar / INRAe
	Fondard	Tézier Frères
	Garnod	<b>Vilmorin-Andrieux / Limagrain</b>
Hermant		
IRA Versailles / INRAe		

Country	Breeder (or location)
<b>AUS USA</b>	Farrer
<b>BEL</b>	<b>Gembloux</b>
<b>CHE</b>	<b>Gustave Martinet/Agroscope</b>
<b>CND</b>	Saunders
<b>DEU</b>	Heine Krafft <b>Leutewitz / DSV</b> Rimpau <b>Strube</b>
<b>GBR</b>	Bamham Biffen Cambridge Bormans Carter King Sherriff Teverson

Country	Breeder (or location)
<b>HUN</b>	Bankuti
<b>ITA</b>	Avanzi Passerini <b>Sta.Rieti / CREA ?</b> Strampelli Todaro
<b>NLD</b>	Brokema
<b>SWE</b>	<b>Svalöf / Lantmännen</b>





# Wheat Breeders in this poster still active

TODAY	FORMER NAME
SYNGENTA (FRA – INT.)	<i>BENOIST</i>
AGROSCOPE-DSP (CHE)	<i>Gustave Martinet, Station de contrôle des semences</i>
LEMAIRE-DEFFONTAINES (FRA)	<i>LEMAIRE</i>
DSV (DEU)	<i>LEUTEWITZ</i>
Ets. DESPREZ (FRA)	<i>Idem</i>
INRA-AGRIOBTENTIONS (FRA)	<i>3 STATIONS</i>
STRUBE (DEU)	<i>Idem</i>
LANTMÄNNEN (SWE)	<i>SVALÖF</i>
LIMAGRAIN (FRA – INT.)	<i>VILMORIN-ANDRIEUX -&gt;VERNEUIL</i>
(CREA) (ITA)	<i>Sta.Rieti</i>
(GEMBLoux) (BEL)	<i>Idem</i>

# Famous cultivars

- Hâtif inversable

(Gros Bleu x Chiddam d'automne)

Direct parent of 57 acc.



- Shireff-Square-Head

Direct parent of 16 acc.



- Rieti, Ardito, Mentana

Direct parent of 17 acc.



- Vilmorin 23 & 27

Direct parent of 23 & 22 acc.



- Noé (Gros-bleu, Japhet, Rouge de Bordeaux)

Direct parent of 10 acc.



- Alliés

Direct parent of 20 acc.



- Wilhelmine

Direct parent of 20 acc.



- Teverson

Direct parent of 12 acc.



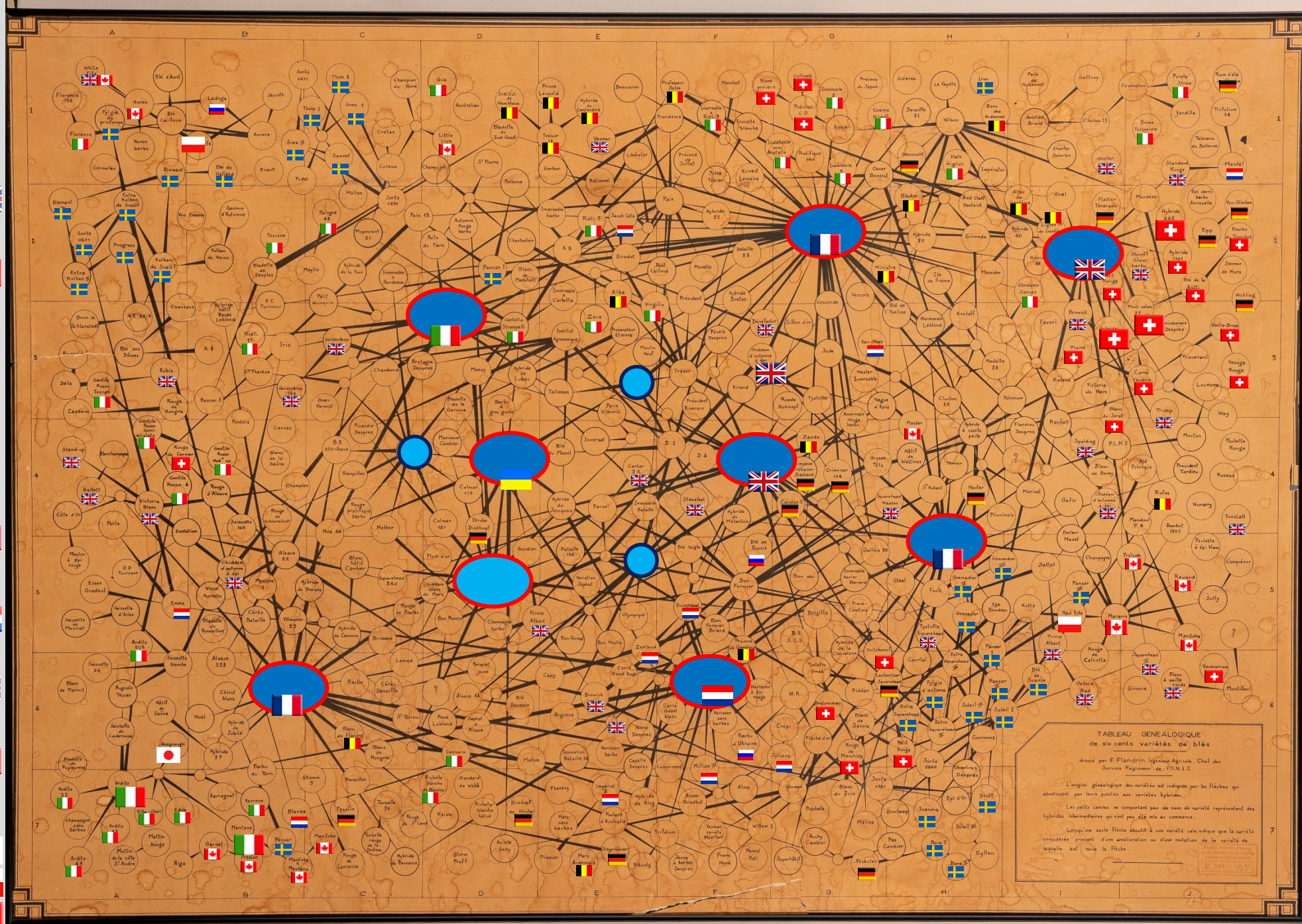
- Mont-Calme

- Swedish cultivars

- Akagomughi

- Red Fife

- Marquis





# In Summary

- At the beginning of breeding the exchange of genetic resources, even without fast mail delivery and without email and internet, was frequent and sometimes between very far away breeders or countries
- Some founder varieties have had a huge impact on the cultivation and quality of wheat, at the national and sometimes international level
- Many wheat breeders have disappeared
- A very large part of the landrace and old cultivars is still available in gene bank



## Next step ?

1. After genotyping we can compare the same accessions from different gene bank (CIMMYT-Mexico, N.I. VAVILOV-Russia, CRB INRA-France, AGROSCOPE-Switzerland, IPK-Germany):
  - *How similar are the “same” cultivars/accessions ?*
  - *What discrepancies were caused by multiplications in separate gene banks ?*
2. When possible, based on genotyping of all conserved accessions
  - *Could we check if the pedigree are really as described into the poster ?*
  - *Which genetic part of the “famous cv” have been preferentially maintained through the descendants ?*
  - *Which genetic part have been neglected and could be of interest in the future, **and is still available thanks the gene banks !***

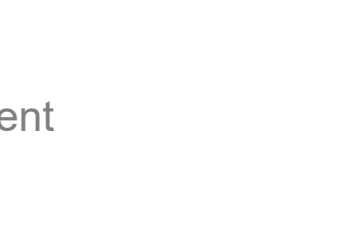
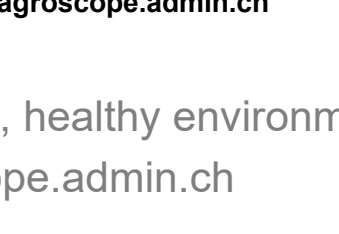
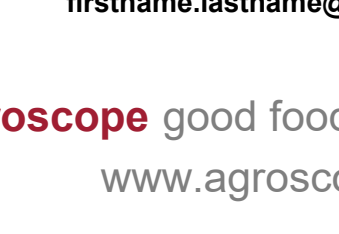
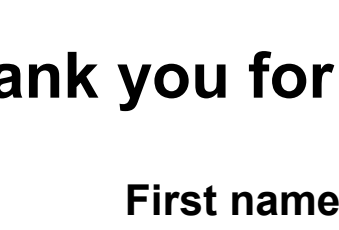
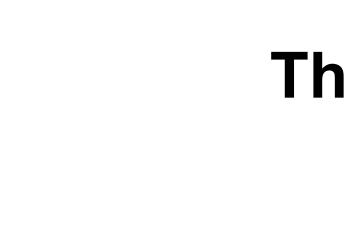
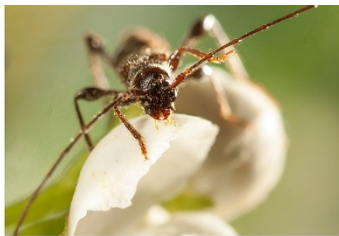


**Thank you for your attention**

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