



Virus Diseases Sub-Group Report

CORESTA Meeting, Izmir - 2015



SG History

- ❖ **SG Collaborative study on PVY (1995 – 2007)**
 - **Originally set up in 1995**
 - Assessing in the field a set of inbred lines for PVY virus symptoms
 - Interim report 1995-2002 presented at Bucharest, 2003
 - **Collaborative experiment pursued 2004-2011**
- ❖ **SG Collaborative study on virus diseases (2008-2012)**
 - **2011: last year of the collaborative study in the field**
- ❖ **SG virus diseases (VIR) since 2013**



Objectives

❖ Objectives:

- **1. To compare the viral data (1996 to 2011) with climatic / aphid data.**
 - To synthesize the viral data obtained and present results in a final report
- **2. To promote sharing of experience in coping with tobacco virus diseases.**

❖ Coordinator & Liaison:

- **Jean-Louis VERRIER, Bergerac Seed & Breeding, France**



Collaborative Experiment 1996-2011

❖ Important & complex data set

- **Field trials with data: 292**
- **Countries: 29**
 - Plus description data:
 - Location,
 - Date of transplantation,
 - Date of reading, etc.

❖ Interesting due to

- **The differential host series**
 - 7 lines constantly studied 15 years
- **The geographic extension and duration**
 - Studies concerning the duration of resistances...



7 lines tested 15 years

Line-or variety-name	Type	Origin	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Virginia A Mutant	Flue-cured	Germany	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tennessee 86	Burley	USA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
PBD 6	Dark Air-cured	France		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Virginia SCR	Flue-cured	Germany	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Wislica	Flue-cured	Poland							x	x	x	x	x	x	x	x	x	x
Zamojska	Flue-cured	Poland						x										
VRG 2	Flue-cured	Poland														x	x	x
VTA	Flue-cured	Poland														x	x	x
Burley 21	Burley	USA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Habana 92	Dark Air-cured	Cuba						x	x	x	x	x	x	x	x			
NCTG 52	Flue-cured	USA	x	x	x	x	x											
Mac Nair 944	Flue-cured	USA	x	x	x	x	x											
NC 95	Flue-cured	USA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
K 326	Flue-cured	USA		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Kentucky 17	Burley	USA						x	x	x	x	x	x					

vava

VaVa

Balanced by tobacco type and presence-absence of va



Initial steps to complete objective 1

Securing data from the collaborative experiment	To be done	In course	Done
Gathering all data in 1 file			X
Standardization of countries and location names			X
Listing the participant organizations		X	
Organizing data			X
Cross checking data		X	
Completion of missing information			X
"Read me" sheet to explain the meanings of data			X



Steps to complete objective 1

Studying data from the collaborative experiment	To be done	In course	Done
Gathering climatic / aphid data	X		
Assessing field tests for relevance to PVY studies			X
" " " " " " " " other " "			X
PVY occurrence study		X	
PVY strains study		X	
Reactions of inbred lines to PVY			X
Reactions of inbred lines to CMV			X



Importance of data « cleaning » and selecting

- ❖ **Discarded due to inconsistent results:**
 - 9 tests
- ❖ **PVY study (resistance breaking)**
 - 39 tests: no to low PVY symptoms
 - Discarded for this purpose
- ❖ **Reaction of lines to CMV**
 - All tests with no CMV symptoms discarded
- ❖ **Etc...**



Collaborative virus study map of the synthetic report

- ❖ Purpose of report and study
- ❖ Presentation of the experiment
 1. Virus occurrence and distribution
 2. Reaction of the tested lines to viruses
 3. Evolution of viruses
- ❖ Annexes
 - List of participant organizations
 - Information regarding the differential host series
 - Detailed results by geographic area



Collaborative study synthetic report map

❖ Virus occurrence and distribution

- **PVY, CMV, TMV, TSWV, other**
 - PVY: variations of occurrence
 - Low and high years in Europe
- **Synthesis by geographic area**



Collaborative study synthetic report map

- ❖ **Reaction of the tested lines to viruses**
 - **PVY (VaVa and vava lines)**
 - **CMV**
 - **Other**
 - **Comment for each line**



Collaborative study synthetic report map

❖ Evolution of viruses

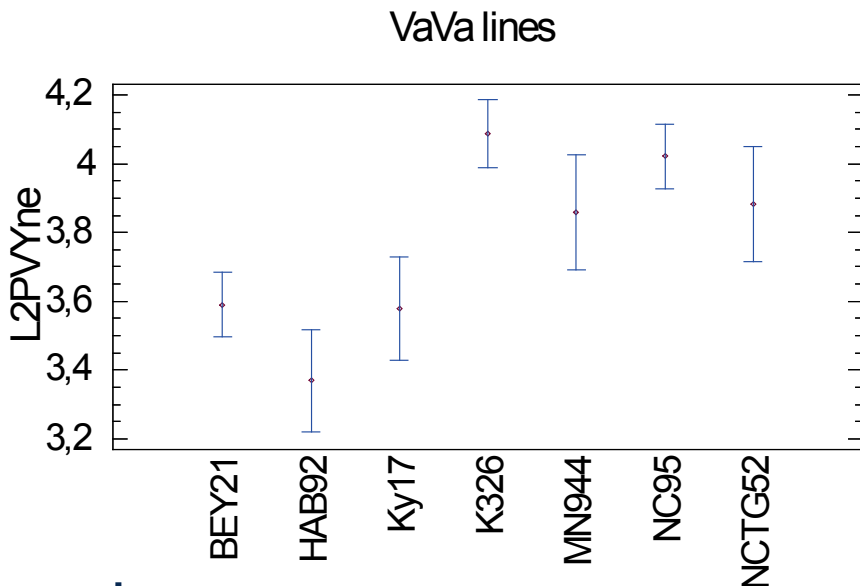
➤ PVY

- Evolution of « va » breaking strains,
 - Europe
 - Africa and Asia



PVY necrotic symptoms / VaVa line

$L2PVY_{ne} = \text{Log}_2(\text{frequency of PVY necrotic symptoms})$



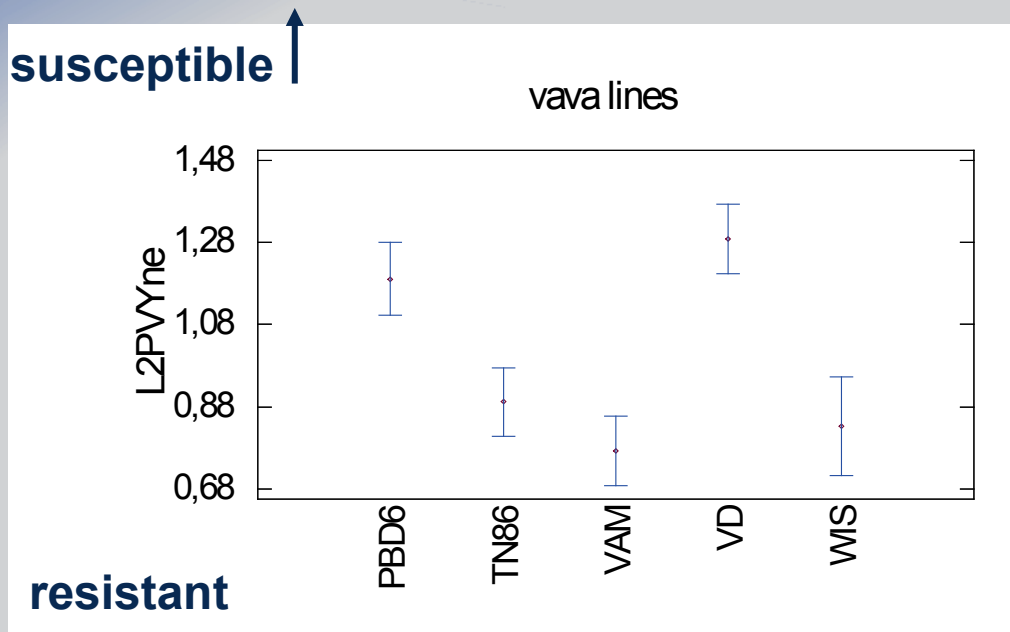
resistant ↓

- ❖ Selected tests
- ❖ VaVa lines not all equivalent
- ❖ While all susceptible

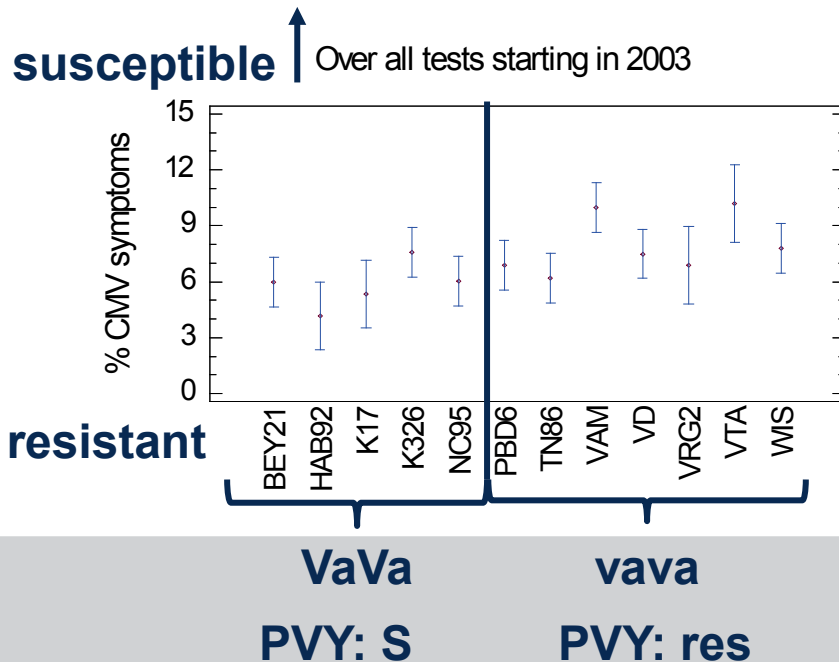


PVY necrotic symptoms / vava line

$$L2PVYne = \text{Log}_2(\text{frequency of PVY necrotic symptoms})$$



- ❖ Selected tests
- ❖ vava lines not all equivalent
- ❖ In line with other findings



Slight differences among lines

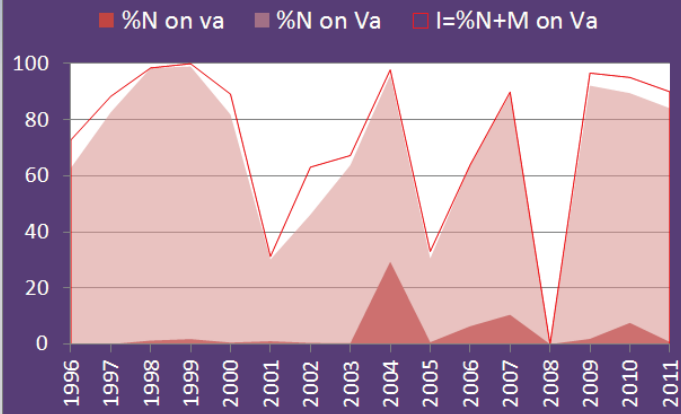
Not less symptoms on vava

To be considered by tobacco type



Variations of PVY incidence by country, Europe

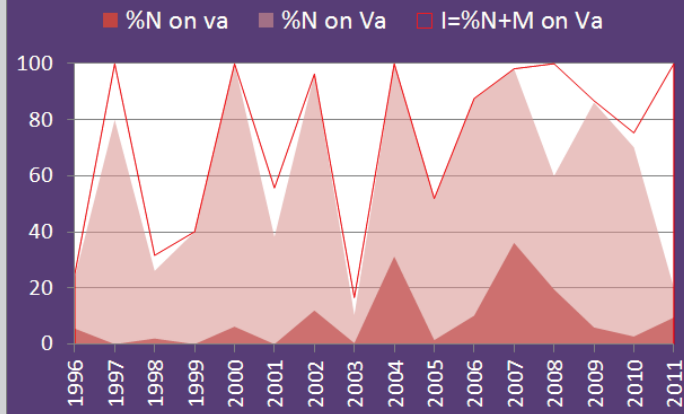
Switzerland



No test in 2008



Germany



Increase of % N on vava?



Acknowledgements

- ❖ Thanks to all participants in the Collaborative Experiment
- ❖ Thanks to the former Coordinator Teresa Doroszevska