

Summary CORESTA Collaborative Experiment on Varieties 2009

1. Participants

Altogether 11 organizations from 10 different countries participated in the Collaborative Experiment 2009. At six locations blue mold was observed. In Switzerland only the susceptible check was infested and therefore an evaluation in detail wasn't carried out. In Cuba, there were a lot of problems with black shank in the trial and it was only possible to classify the varieties as "susceptible", "moderate resistant" and "resistant".

Country	Organization	Contact person(s)	Blue mold in the trial	Experimental design	Remarks
Bulgaria	Tobacco and Tobacco Products Institute	Hristo Bozukov	no		
Cuba	Estacion Experimentale del Tobacco	Humbert Garcia	yes	1 replication	A lot of plants were destroyed by black shank
France	ITB Bergerac Imperial Tobacco Group	Jean-Louis Verrier Bernard Cailleateau	yes Metalaxyl resistant strain	RCB, 4. replications 1 rating	
FYROM	Tobacco Institute Prilep	Vera Dimeska	no		
Germany	LTZ Augustenberg	Norbert Billenkamp	yes Metalaxyl resistant strain	1 replication 7 ratings	
Guatemala	Alliance One	Ernesto Navarez	yes	RCB, 2 location 4. replications 4 rating	
Iran	Rasht Tobacco Research Institute	Mahmad Barzegarkho	no		
Iran	Tirtash Tobacco Research Institute	Mohammed Reza Najafi			
Switzerland	SOTA, Centre Suisse de Recherches sur le Tabac	Gernot Alber	yes but only Jupiter	RCB, 4 replications 2 planting dates	
Spain	CETARSA	Miguel Garcia Granados	no		
USA	University of Kentucky	Kenny Seebold	yes Metalaxyl resistant strain	RCB 3 replications	

2. Variety set

Twelve varieties from six different countries were tested in the trial in 2009! Because of shipping problems, the two varieties from Cuba were only tested by themselves! One variety from FYROM had very poor germination capacity and was therefore only tested in the USA. For two varieties the seed quantity wasn't sufficient for all participants and they couldn't be tested at all locations.

Variety	Country	Organization	Remarks
Jupiter	Germany	LTZ Augustenberg	Susceptible check
Bel 61-10	USA	United States Department of Agriculture	Resistant check
BCE / 09 / VC1			Coded variety
V972 Flue cured	Germany	LTZ Augustenberg	
B911 Burley	Germany	LTZ Augustenberg	
ITB 420 DAC	France	ITB Bergerac Imperial Tobacco Group	Not enough seeds available for all participants
ITB 569 Burley	France	ITB Bergerac Imperial Tobacco Group	
ITB 583 Burley	France	ITB Bergerac Imperial Tobacco Group	
Stella Burley	Switzerland	SOTA, Centre Suisse de Recherches sur le Tabac	
B-2/93 Burley	FYROM	Tobacco Institute Prilep	
V53 Flue cured	FYROM	Tobacco Institute Prilep	Poor germination; only tested in the USA
CT-001	Cuba	Estacion Experimentale del Tobacco	Seeds not available; only tested in Cuba
CT-002	Cuba	Estacion Experimentale del Tobacco	Seeds not available; only tested in Cuba
NC 2002	USA	NCSU	Not enough seeds available for all participants; only pelleted seeds
KT 206	USA	University of Kentucky	Only tested in USA

3. *Blue mold strain*

At most (all???) locations, where blue mold was assessed, the Metalaxyl (-M) resistant strain was present. This strain is less aggressive compared to the sensitive strain, i.e. blue mold epidemic is more slowly.

4. *Characteristics assessed*

Blue mold infestation was assessed at the different locations either as single plant assessments or for the whole plot. At some locations, the infestation of single plants was separated in three parts: bottom, middle and top. At all locations the infestation was rated by numbers using either a scale from 0 (no blue mold) to 9 [10,11] (very serious attack) or 1 (no blue mold) to 9. For the overall analyses, the different rating schemes were “translated” to a 1 to 9 scale and overall means over single plant and/or single plant parts were calculated.

1 - 9 scale	0 - 9 (10,11) scale	% leaf area damaged *
1	0	0 - 0,6 %
2	1	0,6 - 3 %
2	2	3 - 6 %
3	3	6 - 12 %
4	4	12 - 25 %
5	5	25 - 50 %
6	6	50 - 75 %
7	7	75 - 87 %
8	8	87 - 93 %
9	9	93 - 97 %
9	10	97 - 100 %
9	11	100%

Besides the assessment of blue mold in the field all varieties were checked with molecular markers, which indicate the presence or absence of the single dominant resistance gene. Two markers were used: Mil 27, developed in Bergerac / France and SOPR06 from the North Carolina State University / USA.

To describe the varieties regarding their behavior to blue mold attacks, two parameters were calculated: the mean rating values and the slope of the regression lines of the scores over the rating dates! The latter gives an indication how fast blue mold evolves on a given variety - the higher the value the faster the evolvement!

The varieties were classified into three classes: **resistant** (rating < 3,0 and slope < 0,1), **tolerant** (rating between > = 3,0 and < 5,0 and the slope between >= 0,1 and < 0,175) and **susceptible** (rating >= 5,0 and slope >= 0,175)

5. Results

In general, the infestation with blue mold was at nearly all location low and the evolvement slowly! A possible explanation might be the predomination of the Metalaxyl (-M) resistant strain. At all locations with the exception of Coban / Guatemala the susceptible check Jupiter was the most attacked variety! All other varieties were more or less resistant or tolerant. In general, the results fitted very well between the locations! But there is one abnormality at the two Guatemala sites: in opposite to the general trends two varieties (BCE/09/VC1 and B2/93) were much more infested compared to the other sites. An overall summary is given below and the results in detail are given in the attached Excel file.

Variety	Marker		Rating	Slope	Results Cuba
	Mil	SOPR			
Jupiter	m	m	5,66	0,1420	S
Bel 61-10	M	M	1,72	0,0475	R
BCE / 09 / VC1	m	m	2,92	0,1067	MR
V 972*Germany	M	m	2,18	0,0679	MR-R
B 911*Germany	M	M	2,53	0,0644	
ITB 420*France	M	M	2,07	0,0547	
ITB 569*France	M	M	2,00	0,0426	MR-R
ITB 583*France	M	M	2,74	0,0581	S-MR
Stella*Switzerland	M	M	2,44	0,0638	MR
B-2/93*FYROM	M	M	3,13	0,0818	MR-R
V53*FYROM			1,20		
CT-001*Cuba					R
CT-002*Cuba					R
NC 2002*USA	M	M	2,50	0,0467	
KT 206*USA			2,40		