

VIRAL STATUS OF PLUM MOTHER PLANTATIONS IN THREE IMPORTANT CENTERS FROM ROMANIA

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■ Fruit trees can be infected with numerous viruses that affect production and fruit quality, finally resulting significant losses.

■ The aim of present paper is to present some aspects regarding viral disease monitoring as a measure to prevent infections in mother plantations, in order to produce healthy propagating material free of viral pathogens.

**In Romania, the main
centers for the
maintenance of the fruit
tree plantations are:**

**Research Institute
for Fruit Growing
Pitești (RIFG
Pitești)**

**Research Station
for Fruit Growing
Bistrița (RSFG
Bistrița)**

**University of
Craiova-Research
Station for Fruit
Growing Vâlcea
(RIFG Vâlcea)**

MATERIAL AND METHOD

M ă r ă c i n e n i

- Mother plantation for **grafting branches**, biological category **B a s i c**, with *virus tested (VT)* status, established in **2008**, for: Stanley, Pescăruș, Anna Späth, Tuleu Gras, Agent, Centenar, Andreea, Record, Roman, Gras românesc, D 'Agen pum variety;
- Mother plantations, for plum **rootstocks**, **B a s i c** biological category: Mirobolan dwarf, Mirobolan C5, BN 4 Kr, established in **1992** and Mirobolan dwarf and Mirobolan C5 established in **2011**, both with **VT** status.
- Mother plantation for **grafting branch**, **VT** status, **C e r t i f i c a t e** biological category, established in **2014** with the varieties: Stanley, Anna Späth, Centenar, Pescăruș, Agent, Andreea, Tuleu gras.

L e o r d e n i

• *Mother plantation for **grafting branches**, C e r t i f i c a t e*, biological category, VT status, established in 1995 with the varieties: Stanley, Pescăruș, Anna Späth and Tuleu timpuriu.

Virological observations and analyzes refer to the period *2010-2017*.

At the **RSFG Bistrița**, the initial B a s i c material used to establish those two mother plantation was obtained by satisfying EPPO recommended certification standards for *virus free (VF)* status. Research took place between 2016 and 2018 the mother plantations to be referred are:

- Mother plantation B a s i c biological category, under vector protection conditions from 2015 for the: Iulia, Matilda, Geta, Zamfira, Ivan, Dani, Doina, Romaner, Elena, Jubileu 50, Flora, Rencloed Althan, Stanley, Anna Späth, Carpatin, Agent, Gras ameliorat, Centenar, Minerva, Andreea, Delia plum varieties;
- Mother plantation B a s i c biological category, set up in 2014, in **Bața Mihăești** with the varieties: Iulia, Matilda, Geta, Zamfira, Ivan, Elena, Jubileu 50, Flora, Rencloed Althan, Stanley, Anna Spath, Carpatin, Agent, Gras ameliorat, Centenar, Minerva, Andreea, Delia.

At *University of Craiova - RSFG Vâlcea*, the mother plantations existing have VT status. Virological observations and analyzes refer to the period *2010-2017*;

- Mother plantation, C e r t i f i c a t e biological category, established in *2000*, represented by the **rootstocks**: Rival, Oltval, Miroval, Pinval, Oteșani 11, Oteșani 8, Corval ;

- Mother plantation, C e r t i f i c a t e biological category, of **grafting branches** established in *1997* with the: Carpatin, Tuleu Gras, Andreea, Stanley, Diana, Vânăț românesc, Tita and Centenar varieties.

• **Field assessment:** visual inspections and sampling were performed from the beginning of spring to the arrival of high temperatures, the first half of June each year;

• **The ELISA serological diagnosis of Apple chlorotic leaf spot trichovirus (ACLSV), Plum pox virus (PPV), Prune dwarf virus (PDV), Prunus necrotic ringspot (PNRSV), Mirobalan latent ringspot (MLRSV) was according to the working protocol recommended by reagent manufacturers and Bulletin OEPP, 2015, PM 7/125(1);**

• **AgriStrip immunochromatographic only for PPV diagnosis;**

• **Biological testing on the GF 305 indicator, only for PPV diagnosis for Tuleu Gras, Gras Românesc, Centenar, Pescăruș and Anna Spath varieties.**

R E S U L T S

Typical *PPV* visual symptoms

<i>Species</i>	<i>RIFG Pitesti</i> <i>during 2010-2017</i>	<i>RSFG Bistrița</i> <i>during 2016-2018</i>	<i>RSFG Vâlcea</i> <i>during 2010-2017</i>
Nr. evaluated plants / no. infected plants	3,113/42	762/0	1,124/37
Infected varieties / no. plants with visual symptoms	Anna Späth /12 Tuleu gras/6 Centenar/10 Pescăruș/4 D'Agen/10	-	Carpatin/3 Tuleu gras/7 Oltval/6 Stanley/4 Tita/5 Centenar/7 Pinval/5

Results of the ELISA serological test, at **RIFG Pitești**

<i>Location / Year of Establishment</i>	<i>Variety</i>	<i>No. of plants annually tested</i>	<i>Virus detected</i>	<i>No. infected plants on tested period</i>
Mărăcineni 2008-B a s ic /grafting branches	Anna Späth	25	PPV	4
	Tuleu gras	10	PPV	6
	Centenar	10	PPV	5
	Gras românesc	10	PPV	3
	D'Agen	10	PPV	2
	Pescăruș	10	PPV	2
	Agent	20	PDV	3
	Andreea	18	PDV	1
	Stanley	20	-	-
	Record	10	-	-
	Roman	10	-	-
Mărăcineni 1992-B a s ic /rootstocks	Mirobolan dwarf	20	PPV	2
	Mirobolan C5	20	PNRSV	3
	BN 4Kr	15	-	-
Mărăcineni/2011- B a sic/rootstocks	Mirobolan dwarf	25	-	-
	Mirobolan C5	30	-	-

<i>Location / Year of Establishment</i>	<i>Variety</i>	<i>No. of plants annually tested</i>	<i>Virus detected</i>	<i>No. infected plants on tested period</i>
Mărăcineni 2014 C e r t i f i c a t e / grafting branches	Stanley	20	-	-
	Anna Späth	25	PPV	1
	Centenar,	10	-	-
	Pescăruș	10	-	-
	Agent	20	-	-
	Andreea,	20	-	-
	Tuleu gras	20	-	-
Leordeni 1995 C e r t i f i c a t e / grafting branches	Stanley	18	PPV	5
	Pescăruș	10	PPV	3
	Anna Späth	20	PPV	9
			PDV	2
	Tuleu timpuriu	10	PPV	7

Results of the ELISA serological test, at **RSFG Vâlcea**

<i>Location / Year of Establishment</i>	<i>Variety</i>	<i>No. of plants annually tested</i>	<i>Virus detected</i>	<i>No. infected plants on tested period</i>
RSFG-Vâlcea/1997/ Certificate grafting branches	Carpatin	10	-	-
	Tuleu gras	10	PPV	4
	Andreea	10	-	-
	Stanley	10	-	-
	Diana	10	-	-
	Vânăt românesc	10	-	-
	Tita	10	-	-
	Centenar	10	PPV	5
RSFG-Vâlcea/2000/ Certificate rootstocks	Rival	10	-	-
	Oltval	10	PPV	4
			ACLSV	1
	Miroval	10	-	-
	Pinval	10	PPV	4
	Oteşani 11	10	-	-
	Oteşani 8	10	-	-
	Corval	10	-	-

Results of the ELISA serological test, at RSFG Bistrița

<i>Location / Year of Establishment</i>	<i>Variety</i>	<i>No. of total plants tested on 2016-2018 period</i>	<i>Virus detected</i>	<i>No. infected plants</i>
Bistrița /vectors protection- Basic / 2015 grafting branches	Anna Späth	5	-	-
	Stanley	5	-	-
	Carpatin	3	-	-
	Renclod Althan	3	-	-
	Andreea	3	-	-
	Minerva	2	-	-
	Centenar	2	-	-
	Gras ameliorat	2	-	-
	Flora	2	-	-
	Agent	2	-	-
	Delia	2	-	-
	Matilda	2	-	-
	Jubileu	2	-	-
	Geta	2	-	-
	Ivan	2	-	-
	Zamfira	3	-	-
	Elena	3	-	-
	Romaner	3	-	-
	Dani	1	-	-
	Iulia	5	-	-
	Doina	5	-	-

<i>Location / Year of Establishment</i>	<i>Variety</i>	<i>No. of total plants tested on 2016-2018 period</i>	<i>Virus detected</i>	<i>No. infected plants</i>
Bața Mihăești 2014- B a s i c / grafting branches	Iulia	22	-	-
	Zamfira	16	-	-
	Carpatin	16	-	-
	Elena	7	-	-
	Matilda	7	-	-
	Stanley	32	-	-
	Anna Späth	17	-	-
	Renclod Althan	11	-	-
	Minerva	7	-	-
	Geta	5	-	-
	Flora	3	-	-
	Jubileu	3	-	-
	Ivan	4	-	-
	Centenar	11	-	-
	Agent	11	-	-
	Gras ameliorat	7	-	-
	Andreea	8	-	-
	Delia	8	-	-

Results of the biological test at RIFG Pitesti

<i>Mother Plantation / Year of establishment</i>	<i>Biological method</i>			<i>DAS - ELISA</i>	<i>AgriStrip</i>
	<i>Biological indicator</i>	<i>Variety tested/no tree tested/no tree with symptoms</i>	<i>Health status</i>		
Mother plantation branch grafting/ Mărăcineni / 2008	GF 305	Tuleu gras /20/2	Symptoms that could have been associated with viral diseases	Positive	Positive
	GF 305	Gras românesc / 20/1	Symptoms that could have been associated with viral diseases	Negative	Negative
	GF 305	Centenar /20/1	Symptoms that could have been associated with viral diseases	Negative	Negative
	GF 305	Pescăruș /20/1	Symptoms that could have been associated with viral diseases	Positive	Positive
	GF 305	Anna Späth / 30/0	Absence of symptoms	Negative	Negative

Imunocromatografic AgriStrip test



C O N C L U S I O N S

► *During the period 2010-2017*

- At RIFG Pitesti out of the 446 plum plants tested on average annually, 50 plants were found positive to *PPV*, 6 plants were positive for *PDV* and 3 for *PNRSV*.

- At RSFG Vâlcea of the 150 plum plants tested on an average annual, 17 plants were found positive to *PPV* and 1 plant were identified with *ACLSV*.

► *Confirm the increased viral incidence with PPV in plum.*

► *In order to prevent possible future infections with viruses in mother plants, visual assessments accompanied by laboratory and biological tests should be continued; for the accuracy of viral diagnosis in wood species is recommended along with the use of the bioassay method and a laboratory method.*

► *Establishing and maintenance of mother plantation under vectors protection is a viable option for avoiding PPV infections in endemic countries.*

► *It can also be noticed that the younger mother plantations is less infected with viruses, confirming once again that plants can become infected / reinfected as a result of the influence of factors favoring the spread of viruses.*





***THANK YOU
FOR YOUR
ATTENTION!***