

SUPPLEMENTARY MATERIALS

to the article I.V. Totsky, I.V. Rozanova, A.D. Safonova, A.S. Batov,

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“Genotyping of potato samples from the GenAgro ICG SB RAS collection using DNA markers of genes conferring resistance to phytopathogens”

Supplement 1. Varieties and hybrids of potatoes

No.	VIR catalog No.	Variety/hybrid	Pedigree	Originator
1	22164	Fregata	PG 288 × Gitte	Plant Breeding and Acclimatization Institute (Poland), Leibniz Institute of Plant Genetics and Crop Plant Research (IPK)
2		Agata	VM 52 72 × Sirco	Institut National de la Recherche Agronomique (INRA), Science and Advice for Scottish Agriculture (SASA), Centro Interprovinciale di Sperimentazione AG, Nederlands Potato Consultative Foundation (NIVAP)
3	12145	Alyona	(Sedov × Kameraz) × Zarevo	The Federal State Budgetary Institution of Science “Omsk Agricultural Scientific Center”
4	24624	Antonina	Elvira × Zarevo (<i>S. dimissum</i> , <i>S. andigenum</i> , <i>S. leptostigma</i>)	The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences
5	24762	Aroza	Alwara × Duca	Solana GMBH & CO KG
6	25074	Bozhedar		Potato Production of The National Academy of Agrarian Sciences of Ukraine
7	25339	Bravo	06-11-1 × 0-5-7	Ural Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science Ural Federal Agrarian Research Center of the Ural Branch of the Russian Academy of Sciences
8	25199	Vasilyok	Chugunka × D-31-88	Russian Potato Research Center
9	25201	Velikan	Effekt × 946-3	
10	25454	Virazh	Gloriya × 282-97	Falenki Breeding Station – Branch of The Federal State Budgetary Institution of Science “Federal Agrarian Scientific Center of the North-East named after N.V. Rudnitsky”
11	25434	Vympel	G.128-6 × Pikasso	Russian Potato Research Center
12		Gala		Norika Nordring-Kartoffelzucht- und Vermehrungs-GMBH Gross Lusewitz
13	11826	Golubizna	Gatchinskij × 128-6	Russian Potato Research Center
14	25311	Gornyak	96 22-2 × 0-5-7	Ural Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science Ural Federal Agrarian Research Center of the Ural Branch of the Russian Academy of Sciences
15	11652	Granat	13108.2 × 1482-013	Republican Unitary Enterprise “Research and Practical Centre of National Academy of Sciences of Belarus for Potato, Fruit and Vegetable Growing”
16	22096	Granola	3333 60 × 267 04	Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Science and Advice for Scottish Agriculture (SASA)
17	25455	Gulliver	Concorde × Adora	Russian Potato Research Center
18	25436	Gusar	Interspecific hybrid: <i>S. dimissum</i> , <i>S. stoloniferum</i> , <i>S. vernei</i> , 2f <i>S. phureja</i> , <i>S. andigenum</i> , <i>S. tuberosum</i>	Breeding firm “LIGA” (limited liability company)
19	12166	Debryansk	Nikulinskij × 480-43	Russian Potato Research Center
20		Diamant		Agrico U.A. Netherlands
21	25004	Zhigulyovskij	Pransa × Aksenovskij	Samara Research Institute of Agriculture after N.M. Tulaiikov – Branch of The Federal State Budgetary Institution of Science The Samara Federal Research Centre of the Russian Academy of Sciences
22	11825	Zhukovskij rannij	Yagodka × Hydra	Russian Potato Research Center
23	11982	Zagadka	Gatchinskij × Culpa	
24		Zekura	1505 70 × Culpa	SAKA Pflanzenzucht GBR (Solana GMBH & CO KG), Ragis Kartoffelzucht- und Handelsgesellschaft MBH, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK)

Supplement 1 (continued)

No.	VIR catalog No.	Variety/hybrid	Pedigree	Originator
25	25456	Zlatka	379-2 × Omega	Siberian Research Institute of Plant Production and Breeding – Branch of The Federal State Budgetary Institution of Science The Federal Research Center Institute of Cytology and Genetics of the Siberian Branch of the Russian Academy of Sciences
26	11919	Il'inskij	Atlantic × MV-168	Russian Potato Research Center
27		Impala	VM 52 72 × Biranco	Agrico U.A. Netherlands, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Netherlands Potato Consultative Foundation (NIVAP)
28	24712	Irbitskij	SSE × Velox	Ural Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science Ural Federal Agrarian Research Center of the Ural Branch of the Russian Academy of Sciences
29	25191	Kemerovchanin	Udacha × Prolisok	Kemerovo Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences
30	22812	Klada	Kr.M7 × Ulster Premier	An Forastaluntais, Science and Advice for Scottish Agriculture (SASA)
31		Koldovskaya		Not available
32	12167	Kolobok	KZ 1001 × 733-65	Russian Potato Research Center
33	25341	Kortni	91.3.29 × Ausoniya	Tatar Research Institute of Agriculture – Subdivision of the Federal State Budgetary Institution of Science The Federal Research Center "Kazan Scientific Center of the Russian Academy of Sciences", Russian Potato Research Center
34	12168	Krepys	2953-34 × Shurminskij-2	Russian Potato Research Center
35	25005	Kuznechanka	Nevskij × Zarevo	Kemerovo Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences
36	12197	Ladozhskij		Vsevolozhsk breeding station (limited liability company)
37	12109	Lina	{Omega × [(Gatchinskij × 238/18-9) × (<i>S. andigenum</i> 1793 × <i>S. rubinii</i>)]} × Anco	Siberian Research Institute of Plant Production and Breeding – Branch of The Federal State Budgetary Institution of Science The Federal Research Center Institute of Cytology and Genetics of the Siberian Branch of the Russian Academy of Sciences
38	25438	Lomonosovskij	89287/1 × 8334/20	Russian Potato Research Center
39	12094	Lyubava	Udacha × 733-65	Kemerovo Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences
40	25457	Lyuks	Beluga × 0-5-7	Ural Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science Ural Federal Agrarian Research Center of the Ural Branch of the Russian Academy of Sciences
41	12226	Maret	Vita × Frila	Estonia
42	24723	Matushka	Ramenskij × 27B-662	Penza Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science "Federal Scientific Center for Bast Cultures"
43	25212	Meteor	G. 84.19/44 × Shurminskij-2	Russian Potato Research Center
44		Monaliza	Bierma A 1 287 × Colmo (adg)	HZPC Holland B.V., Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Centro Interprovinciale di Sperimentazione AG, Institut National de la Recherche Agronomique (INRA), Science and Advice for Scottish Agriculture (SASA), University of Pannonia, Netherlands Potato Consultative Foundation (NIVAP)
45	11916	Nakra	596r-76 × Zarevo	Kemerovo Research Institute of Agriculture – Branch of The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences, Russian Potato Research Center

Supplement 1 (end)

No.	VIR catalog No.	Variety/hybrid	Pedigree	Originator
46	12157	Nayada	<i>S. vrn</i> , <i>S. phr</i> , <i>S. dms</i> , <i>S. sto</i> , <i>S. adg</i> , <i>S. tbr</i>	Breeding firm "LIGA" (limited liability company), The Federal State Budgetary Institution of Science The Vavilov Institute of General Genetics
47	10736	Nevskij	Veselovskij × Kandidat	Leningrad Research Institute of Agriculture "Belogorka" – Branch of The Russian Potato Research Center, Russian Potato Research Center
48	12171	Nikulinskij	Mavka × Peresvet	Russian Potato Research Center
49	12105	Pamyati Osipovoj	77/24 {B4 <i>S. stoloniferum</i> } × 2266/2 four backcrossing events with a <i>S. stoloniferum</i> , pollinated by <i>S. dimissum</i> hybrid	
50	24625	Pamyati Rogachyova	Elvira × Zarevo	The Federal State Budgetary Institution of Science The Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences, Russian Potato Research Center
51		Pikasso	Cara × Ausonia	Agrico U.A. Netherlands, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Centro Interprovinciale di Sperimentazione AG, Science and Advice for Scottish Agriculture (SASA), Nederlands Potato Consultative Foundation (NIVAP)
52	25313	Reggi	Etyud (seedling of Adretta) × Ermak	Tatar Research Institute of Agriculture– Subdivision of the Federal State Budgetary Institution of Science The Federal Research Center "Kazan Scientific Center of the Russian Academy of Sciences"
53		Red Skarlet	ZPC 800239 × VGB78-286	HZPC Holland B.V.
54	25460	Safo	Pentland Crown × 403-4	Siberian Research Institute of Plant Production and Breeding – Branch of The Federal State Budgetary Institution of Science The Federal Research Center Institute of Cytology and Genetics of the Siberian Branch of the Russian Academy of Sciences
55	25295	Favorit	Udacha × Romanze	Russian Potato Research Center
56	25220	Fioletovyj	PRT 703 × 1092-7	
57	25345	Fritella	Effekt × Innovator	
58	25462	Yuna	Krasnaya roza × Aspiya	Siberian Research Institute of Plant Production and Breeding – Branch of The Federal State Budgetary Institution of Science
59		1-7-5A		The Federal Research Center Institute of Cytology and Genetics
60		(1-9-2)		of the Siberian Branch of the Russian Academy of Sciences
61		2-5-4B		
62		1-14-2A		
63		1014/3-1		
64		821/1-5		
65		419/8-1		
66		1014/8-1		
67		1013/3-1		
68		790/1-5		
69		(2-5-2)		
70		785/8-5		
71		999/1-1		
72		597/4-1		
73		417/2		

Note. VIR – Federal Research Center the N.I. Vavilov All-Russian Institute of Plant Genetic Resources.

Supplement 2

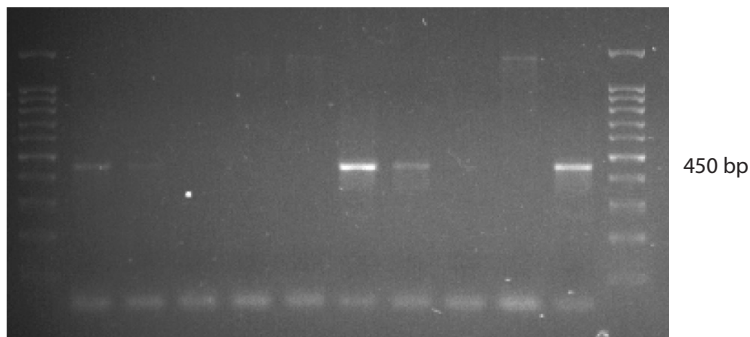


Fig. 1. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.
Varieties from left to right: 785/8-5, Agata, Alyona, Antonina, Arlekin, Bozhedar, Bravo, Vasilyok, Velikan, Virazh.

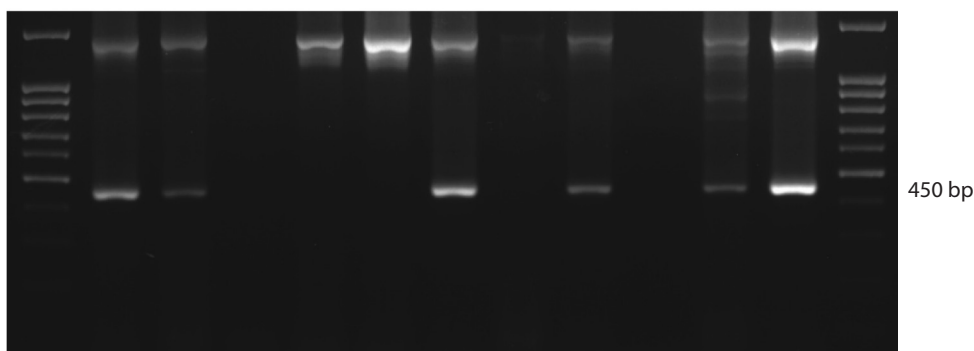


Fig. 2. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.
Varieties from left to right: Bozhedar, Vympel, G 06-08-2015, G 21.8561, G 3-43-6, Gala, Golubizna, Gornyak, Granat, Granola, Gulliver.

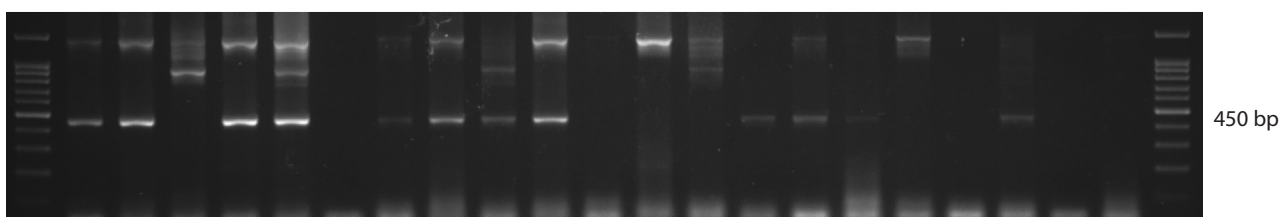


Fig. 3. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.
Varieties from left to right: Gulliver, Gusar, Debryansk, Di Dzhon 12, Diamant, Zhavoronok, Zhigulyovskij, Zhukovskij rannij, Zagadka, Zekura, Zizella, Zlatka, Il'inskij, Impala, Irbitskij, Kemerovchanin, Klada, Kolobok, Kortni, Krepysh, Kuznechanka.

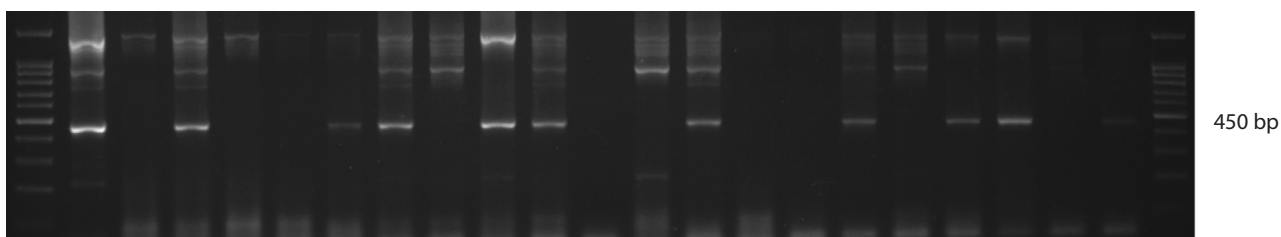


Fig. 4. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.
Varieties from left to right: Granola, Ladozhskij, Lina, Lomonosovskij, Lyubava, Lyuks, Maret, Matushka, Meteor, Milavica, Monaliza, Nakra, Nayada, Nevskij, Nikulinskij, Novosibirskij, Pamyati Osipovoj, Pamyati Rogachyova, Pikasso, Reggi, Red Skarlet.

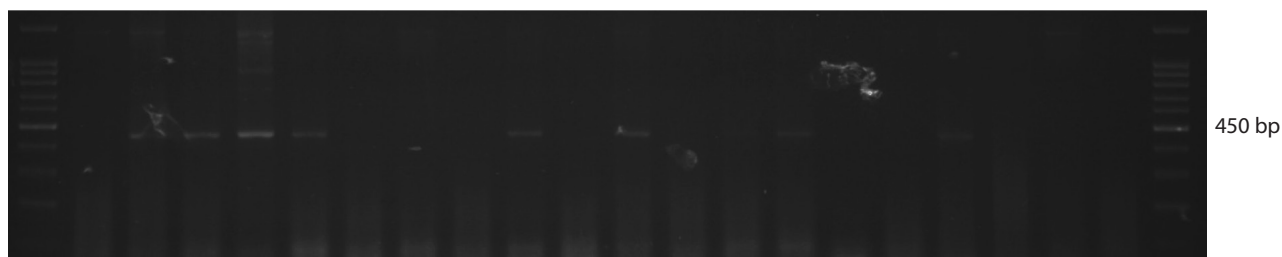


Fig. 5. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.

Varieties from left to right: Zlatka, Yuna, Safo, Lina, 710/10-5, 1-7-5A, (1-9-2), 2-5-4B, 1-14-2A, 1014/3-1, 821/1-5, 419/8-1, 1014/8-1, 1013/3-1, 790/1-5, 826/1-5, (2-5-2), 785/8-5, 999/1-1, 597/4-1.

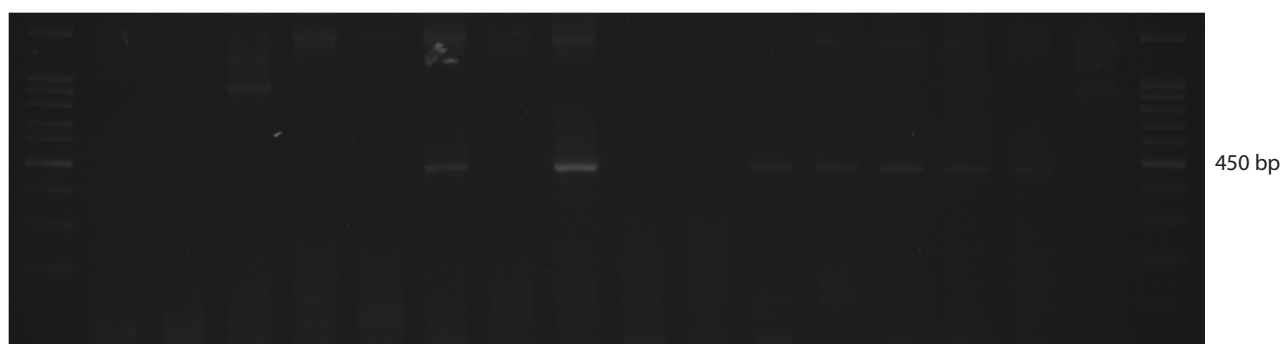


Fig. 6. The presence of a diagnostic DNA marker 57R (450 bp) in potato samples.

Varieties from left to right: Favorit, Lyubava, Fioletovyy, Koldovskaya, Nakra, Meteor, Kuznechanka, Aroza, Fritella, 418/3, 479/5, 417/2, Bekas, Fregata, MG 478, MG 1753/6.

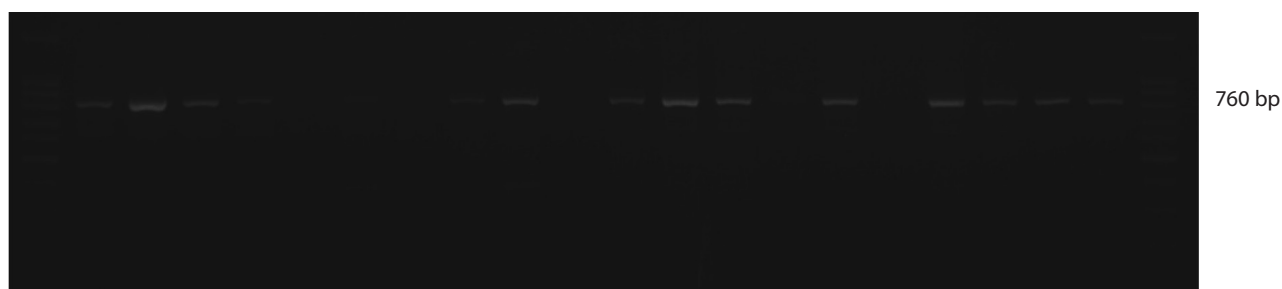


Fig. 7. The presence of a diagnostic DNA marker CP113 (760 bp) in potato samples.

Varieties from left to right: Ladozhskij, Lina, Lomonosovskij, Lyubava, Lyuks, Maret, Matushka, Meteor, Milavica, Monaliza, Nakra, Nayada, Nevskij, Nikulinskij, Novosibirskij, Pamyati Osipovoj, Pamyati Rogachyova, Pikasso, Reggi, Red Skarlet.

Supplement 3. Resistance of potato varieties and hybrids to PCN and the presence of DNA markers 57R and CP113

No.	Variety/hybrid	Resistance to golden potato cyst nematode	Presence of marker		
			57R	CP113	Gro1-4
1	Fregata	+	+	–	–
2	Agata	+	–	+	
3	Alyona	–	–	+	
4	Antonina	–	–	+	
5	Aroza	+	+	–	–
6	Bravo	+	+	+	
7	Vasilyok	–	–	–	
8	Velikan	–	–	+	
9	Virazh	+	+	–	
10	Vympel	+	+	+	
11	Gala	+	+	+	
12	Golubizna	–	–	+	
13	Gornyak	–	+	–	
14	Granat	–	–	–	
15	Granola	+	+	+	
16	Gulliver	+	+	+	
17	Gusar	+	+	–	
18	Debryansk	–	–	+	
19	Diamant	+	+	–	
20	Zhigulyovskij	–	+	–	
21	Zhukovskij rannij	+	+	–	
22	Zagadka	+	+	–	
23	Zekura	+	+	–	
24	Zlatka	–	–	–	+
25	Il'inskij	–	–	+	
26	Impala	+	+	–	
27	Irbitskij	+	+	–	
28	Kemerovchanin	+	+	–	
29	Klada	–	–	+	
30	Koldovskaya	–	–	–	–
31	Kolobok	–	–	–	
32	Kortni	+	+	–	
33	Krepysh	+	–	–	
34	Kuznechanka	–	–	–	–
35	Ladozhskij	+	–	+	
36	Lina	–	+	+	–
37	Lomonosovskij	–	–	+	
38	Lyubava	–	–	+	–
39	Lyuks	+	+	–	
40	Maret	+	+	+	
41	Matushka	–	–	–	
42	Meteor	+	+	+	–
43	Monaliza	–	–	–	

Supplement 3 (end)

No.	Variety/hybrid	Resistance to golden potato cyst nematode	Presence of marker		
			57R	CP113	Gro1-4
44	Nakra	–	–	+	–
45	Nayada	+	+	+	
46	Nevskij	–	–	+	
47	Nikulinskij	–	–	–	
48	Pamyati Osipovoj	–	–	–	
49	Pamyati Rogachyova	–	+	+	
50	Pikasso	+	+	+	
51	Reggi	–	–	+	
52	Red Skarlet	+	+	+	
53	Safo	+	+	+	+
54	Favorit	+	–	+	–
55	Fioletovyyj	–	–	–	–
56	Fritella	–	–	+	–
57	Yuna	+	+	+	–
58	1-7-5A	–	–	+	+
59	(1-9-2)	–	–	+	–
60	2-5-4B	–	–	+	+
61	1-14-2A	+	+	–	–
62	1014/3-1	+	–	+	–
63	821/1-5	+	+	–	–
64	419/8-1	–	–	–	–
65	1014/8-1	+	+	–	–
66	1013/3-1	+	+	–	–
67	790/1-5	–	–	+	–
68	(2-5-2)	+	+	+	–
69	785/8-5	–	–	+	+
70	999/1-1	–	–	–	–
71	597/4-1	–	–	+	–
72	417/2	–	+	+	–

Supplement 4. Resistance of potato varieties and hybrids to wart and the presence of DNA marker NL25

No.	Variety/hybrid	Resistance to wart	Presence of a NL25 marker
1	Fregata	+	+
2	Agata	+	+
3	Alyona	+	+
4	Antonina	+	+
5	Aroza	+	+
6	Bozhedar	+	+
7	Bravo	+	+
8	Vasilyok	+	–
9	Velikan	+	–
10	Virazh	+	+
11	Vympel	+	+
12	Gala	+	+
13	Golubizna	+	+
14	Gornyak	+	+
15	Granat	+	–
16	Granola	–	+
17	Gulliver	+	–
18	Gusar	+	+
19	Debryansk	+	–
20	Diamant	+	+
21	Zhigulyovskij	+	–
22	Zhukovskij rannij	+	+
23	Zagadka	+	–
24	Zekura	+	+
25	Zlatka	+	–
26	Il'inskij	+	+
27	Impala	+	–
28	Irbitskij	+	–
29	Kemerovchanin	+	+
30	Klada	+	+
31	Koldovskaya	–	–
32	Kolobok	+	+
33	Kortni	+	–
34	Krepysh	+	–
35	Kuznechanka	+	+
36	Ladozhskij	+	+
37	Lina	+	+
38	Lomonosovskij	+	+
39	Lyubava	+	+
40	Lyuks	+	+
41	Matushka	+	+
42	Meteor	+	+
43	Monaliza	+	–
44	Nakra	+	+

Supplement 4 (end)

No.	Variety/hybrid	Resistance to wart	Presence of a NL25 marker
45	Nayada	+	–
46	Nevskij	+	–
47	Nikulinskij	+	–
48	Pamyati Osipovoj	+	–
49	Pamyati Rogachyova	+	–
50	Pikasso	+	–
51	Reggi	+	–
52	Red Skarlet	+	+
53	Safo	+	+
54	Favorit	+	+
55	Fioletovyj	+	+
56	Fritella	+	+
57	Yuna	+	+
58	1-7-5A	+	–
59	(1-9-2)	+	+
60	2-5-4B	+	–
61	1-14-2A	+	+
62	1014/3-1	+	+
63	821/1-5	+	+
64	419/8-1	+	–
65	1014/8-1	+	–
66	1013/3-1	+	–
67	790/1-5	+	–
68	(2-5-2)	+	+
69	785/8-5	+	+
70	999/1-1	+	+
71	597/4-1	–	+
72	417/2	+	+