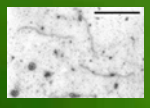
Crop losses* in Russian Federation, 2008

Crops	Gross yield, thousand tons	weeds		pests		viruses		Total
		losses, thous. tons	%	losses, thous. tons	%	losses, thous. tons	%	%
Wheat	63800	11484	18	8294	13	4466	7	31
Sunflower	7400	1406	19	1406	19	-	-	38
Sugar beet	29000	7830	27	3190	11	2900	10	48
Potatoes	28800	4608	16	3456	12	4320	15	43
Corn (for grain)	6700	1340	20	1005	15	-	-	35
Canola	752	128	17	150.4	20	-	-	37

*Statistical Brief«Agriculture of Russian Federation». Moscow, Russian Ministry of Agriculture, 2009 (http://www.mcx.ru/navigation/docfeeder/show/164.htm

Beet yellows virus (BYV)




Total crop weight loss caused by BYV is up to 40%, with sugar reduction of 8-10%

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Beet necrotic yellow vein virus (BNYVV)





BNYVV infections may cause reduction of crop weight and sugar content of up to 50-70%

Rhizomania distributed over most sugar beet growing areas in the world: Asia, China, Japan, the USA, Europe countries and Russia

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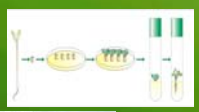
Transgenic sugar beet obtaining





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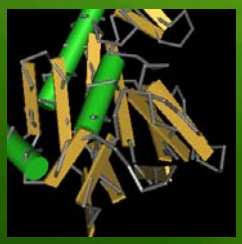
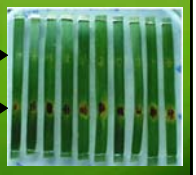
Elicitor activity of MF3-protein tested on wheat leaves of variety Mironovskaya 808 against fungus *Septoria nodorum*



MF3-protein 1.25 mg/ml →

Reference (water) →



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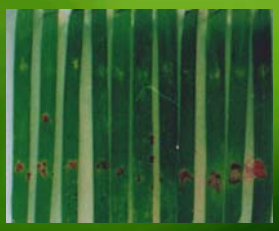
Elicitor activity of MF3-protein tested on wheat leaves of variety Mironovskaya 808 against fungus *Puccinia graminis*

MF3-protein 1.25 mg/ml →

Reference (water) →



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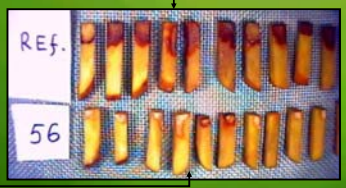
Resistance of transgenic potato plants' tubers to *Erwinia carotovora*

Potato tuber pieces of non-transgenic variety Nevsky

Potato tuber pieces of transgenic variety Nevsky line 56



Potato tuber pieces, place in a Petri dish on moist sterile filter paper, and inoculate with 0.1 - 1 of the bacterial suspen-sion (ca. 106 CFU/ml). Incubate at 20-27°C for 48h and probe the tissue surrounding the inoculation site with a spatula to determine whether decay and tissue maceration has occurred.

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Development of salt–tolerant plants

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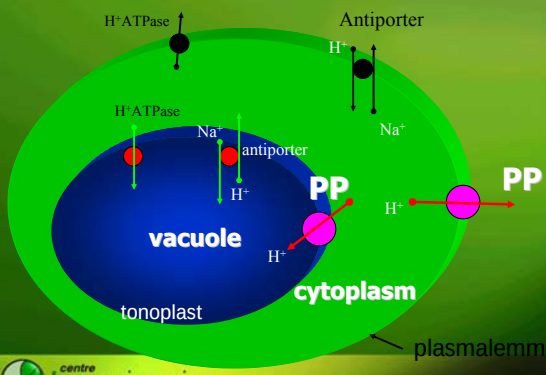
Possible H^+ -pyrophosphatase localization in plant cell



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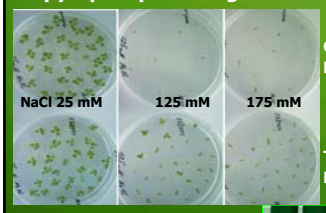
PP - pyrophoshpatase from *Rhodospirillum rubrum*

Salt tolerance of transgenic tobacco expressing H^+ pyrophosphatase gene from *Rhodospirillum rubrum*

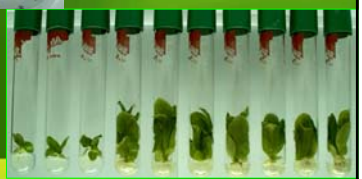


Control plants

Transgenic plants

Seed germination efficiency at different NaCl concentrations

Growth of control and transgenic plants at different NaCl concentrations →



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Development of Russian potato varieties, resistant to Colorado beetle

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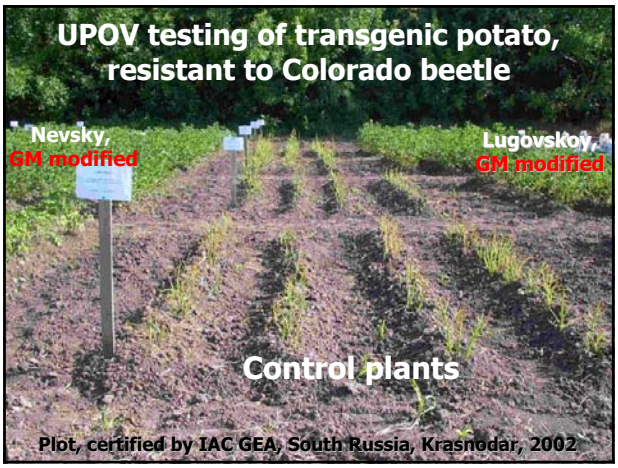
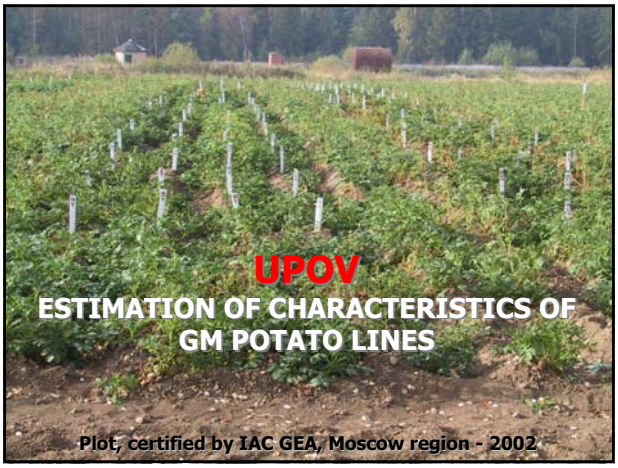
UPOV testing of transgenic potato, resistant to Colorado beetle



Plot, certified by IAC GEA, South Russia, Krasnodar, 2002



UPOV

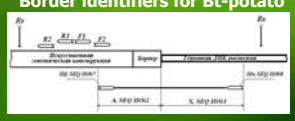
ESTIMATION OF CHARACTERISTICS OF GM POTATO LINES

Plot, certified by IAC GEA, Moscow region - 2002

Transgenic potato obtaining

Southern-blot analysis

Border identifiers for Bt-potato



X+A sequences for Lugovskoy+ Elizaveta+ and Nevskiy+ were used in patent as unique border identifiers

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GM potato IPR protection

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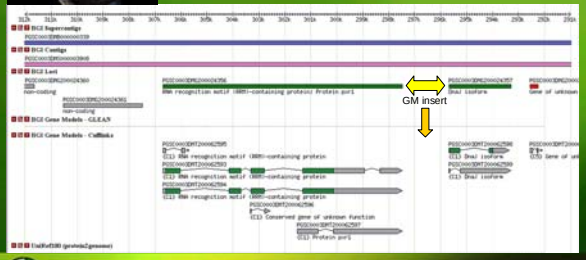
GM potato genomics

The Potato Genome Sequencing Consortium



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Food certificates

# 77.99.26.11.У.6088.7.06 (07 July 2006)	Lugovskoy 1210 amk event
# 77.99.11.11.У.14145.12.05 (14 December 2005)	Elizaveta 2904/1 kgs event

Patents

# AND DATE OF PRIORITY	THE REGISTRATION DATE	ISSUE
# 2231550 24 April 2002	27 June 2004	obtain GM plants of Lugovskoy variety
# 2231549 24 April 2002	27 June 2004	obtain GM plants of Nevskiy variety
# 2231251 27 June 2004	27 June 2004	obtain GM plants of Elizaveta variety
# 2286385 23 November 2004	27 October 2006	Recombinant DNA sequence including Elizaveta variety genome plant DNA and transgenic insert
# 2286386 14 February 2005	27 October 2006	Recombinant DNA sequence including Nevskiy variety genome plant DNA and transgenic insert
# 2007110779 26 March 2007		Recombinant DNA sequence including Lugovskoy variety genome plant DNA and transgenic insert

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Evolution of the regulatory framework in Russia (genetic engineering)

1996	Federal law "On State regulation of genetic engineering activity"
2000	Amendments in respect of gene therapy and genetic diagnostics to Federal law "On State regulation of genetic engineering activity"
2000	Instruction by the RF Chief State Sanitary Physician : "On the order of hygienic expertise of food products, derived from GMOs"
2001	Government Act "On state registration of GMOs", ***Non upgraded till now***
2002	Government Act "On state registration of GM feed", ***upgraded 2006***
2002	"On protection of natural environment" (2002)
2003	The order by the RF Chief State Sanitary Physician : "On the order of microbiology molecular-genetic expertise of GM microorganisms, used in food production"
2005	Federal act "On protection of consumer's rights", ***amended in 2007, 2008***
2010	Amendments in respect of state registration of GMOs to Federal law "On State regulation of genetic engineering activity"
2004 - now	Ongoing technical regulation reform. Ongoing administrative reform.

Russian Federation: Biotech food labeling

"Labeling law" (2002, 2007)

- First step: September 2002- Sanitary and Epidemiol. Rules 2.3.2 1078-01 2002 – Mandatory labeling. 5% threshold.
- Second step: Sept 2007 - Sanitary and Epidemiol. Rules

•Mandatory labeling for product consists of, contains or is produced from GMOs. 0,9% threshold (ingredients considered individually)

•Mandatory labeling for product is produced from GMOs irrespective of the detectability of DNA

•Adventitious presence if transformation events are no more than 0,9% weight

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Russian Federation: Biotech feeds

Thresholds for unintended or technically unavoidable presence of GMO's in Feeds

Letter of Federal Service for Veterinary and Phytosanitary Surveillance (FS-AS-2/4393 of 07 May 2008)

➢0.5% or less of each unregistered GMO component, and

➢0.9% or less - of each registered GMO

Feed containing unintended or technically unavoidable amount of GMO's are not subject to the state registration.

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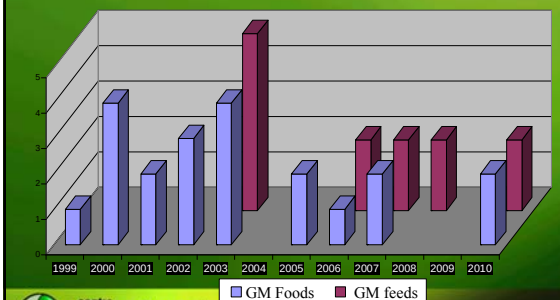
Dynamics of GM foods and feeds registration

Number of registered transformation events/year



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