

Plant Breeding and Seed Industry in Poland

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Topics

- General data on Poland and agriculture
- Governmental institutions related to plant breeding and seed industry
- Plant breeders in Poland
- Main objectives of plant breeding researches
- Seed market of the main crops in Poland
- Plant Breeder's and Seed Industry organizations

General data on Poland

- Surface of the country: 312.685 sq km
- 16 Regions
- Population
38,3 mio. with decreasing tendency
38,2% outside the cities (20,9 - 59,5)
- Population density:
124 inhabitants / sq km
- Currency: Zloty (zl, PLN)
exchange rate: 1 EUR = 4,28 PLN
(November, 2004) 1 USD = 3,27 PLN

Agricultural land in Poland

Agricultural land	18 345 000 ha
of which: arable area	13 922 000 ha
meadows	2 740
pastures	1 379
orchards	304

Structure of the farms

land use	No of farms
1 - 5 ha	2763 thous. ha
5 - 10 ha	3029
10 - 20 ha	3652
20 - 50 ha	2708
more than 50	2310
total	14462

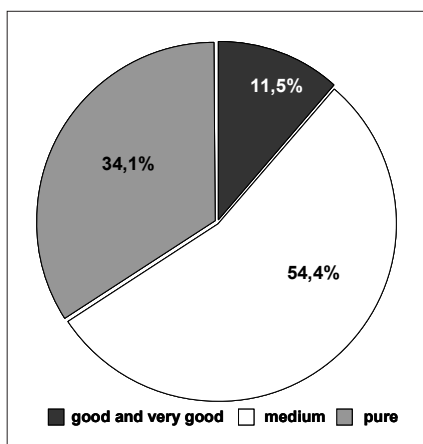
Environmental conditions for agriculture

- Majority of sandy soils
- Low pH of soil
- Strong winters
- NPK ca. 90 kg/ha
- Low usage of pesticides



Weather conditions of plant production

	2001	2002	2003
Vegetation period - days	239	272	258
Average temperature - °C	8,3	9,1	7,1
Precipitation total - mm	725	643	488
in Poznan region - mm	552	588	410



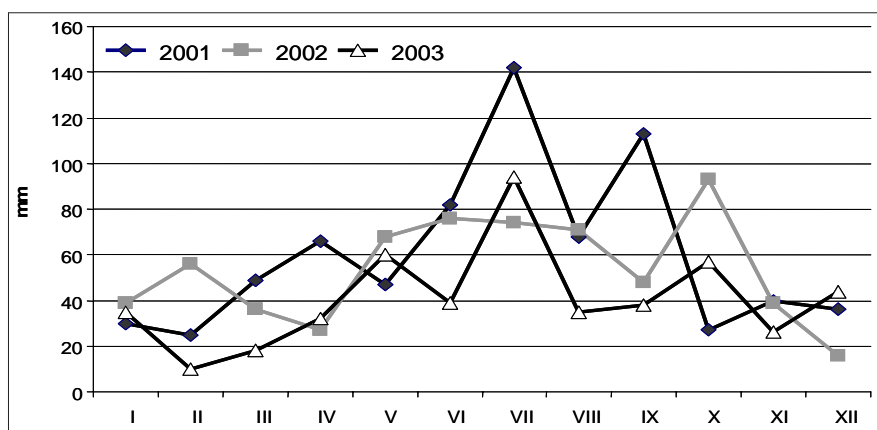
Quality of soil

Main crop cultivation

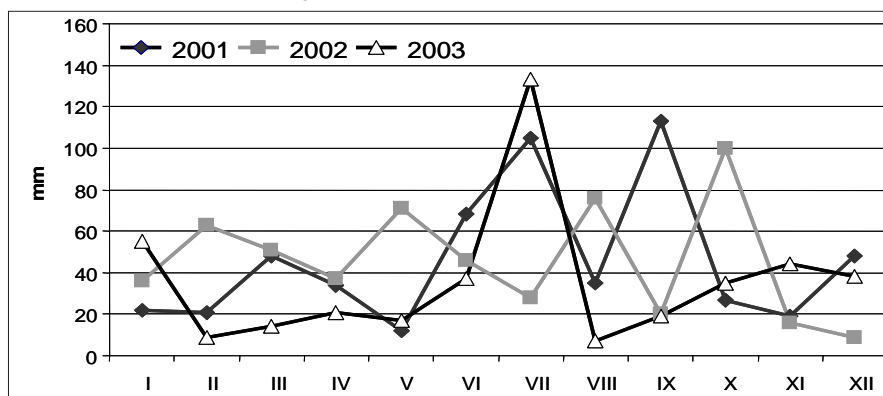
	acreage in 1000 ha
Wheat	2.626
Barley	1.065
Rye	1.807
Oats	557
Triticale	922
Cereal mixed for grain	1.274
Maize (grain)	487
Maize (silage)	162
Cereals	8.900
Oil seed rape	454
Potato	867
Pulses for grain	111
Sugar Beets	322
Feed crops	405
Vegetables	200

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Rainfalls in Poland in the years 2001-2003



Rainfalls in Poznan region in the years 2001-2003

COBORU - Research Centre for Cultivar Testing, www.coboru.pl

- assessment of a variety value for cultivation and use (VCU)
- conducting the DUS tests
- maintaining the Polish National List (NL)
- maintaining the Plant Breeders' Rights Register (PBR)
- coordination of post-registration variety testing system (PDO)
- publishing official information about varieties
- cooperation with national and international institutions, dealing with variety testing, listing and protection, as well as other institutions from the seed sector

PIORIN - State Plant Health and Seed, Inspection Service, www.piorin.gov.pl

- controlling conditions of plant seed and seeding material production and its trading
- outdoors and laboratory verification of seed and seeding material
- protect Poland's territory and crops against pest organisms and prevent their spreading across the country
- supervise correctness of trade and use of plant protection remedies

Agricultural varieties listed in 1999-2004

Year of listing	Domestic varieties	Varieties from abroad	total
1999	71	62	133
2000	67	64	131
2001	51	82	133
2002	59	89	148
2003	48	95	143
2004	54	67	121

Vegetable varieties listed in 1999-2004

Year of listing	Domestic varieties	Varieties from abroad	total
1999	41	136	177
2000	55	97	153
2001	71	154	225
2002	85	201	286
2003	26	87	113
2004	49	179	228

Governmental institutions related to plant breeding and seed industry

Department of Plant Breeding and Plant Protection

- plant breeding and seed production
- protection of genetic resources
- genetically modified organisms
- plant protection
- health quality of biological material
- fertilizers and fertilization
- organic farming

ARR Agricultural Market Agency www.arr.gov.pl

- Export deposit 5 Euro/tonne
- Import deposit 1 Euro/tonne

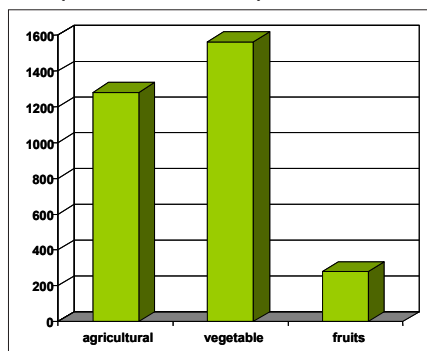
Procedure of official cultivar testing and listing

- Preliminary Trials (1-2 years of breeder's trial)
 - application for testing
 - approval by COBORU Commission
- Official Variety testing
 - DUS test 1-3 years, 1-2 locations, UPOV Guidelines, CPVO Protocols
 - VCU Assessment, 2-3 years, 10-30 loc. 2 treatments
- Variety listing on the decision of COBORU Director
- Post-Registration Trials (PDO) developed and co-ordinated by COBORU
 - listed varieties
 - EU varieties upon positive results of pre-trials

Cereal varieties listed in 1990-2004

Year of listing	Domestic varieties	Varieties from abroad	total
1990	9	3	12
1991	10	3	13
1992	12	1	13
1993	10	1	11
1994	10	1	11
1995	7	1	8
1996	6	1	7
1997	16	-	16
1998	16	1	17
1999	21	3	24
2000	17	5	22
2001	16	10	26
2002	16	8	24
2003	10	17	27
2004	18	7	25

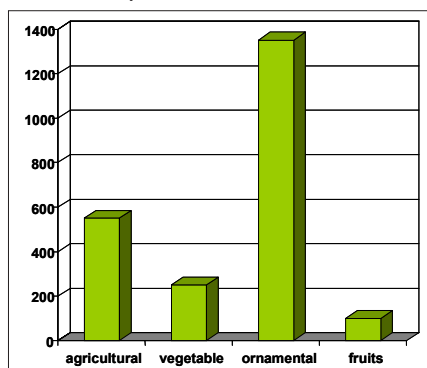
Number of cultivars on the National List (as on 25.03.2004)



Plant Variety Protection

- Plant Breeder's Right is granted if a variety:
 - is distinct, uniform and stable
 - fulfills the novelty criterion
 - has a suitable denomination
 - fulfills administration requirements and fees are paid
- The PBR titles are granted for all *genera* and *species*:
 - 25 years for a majority of plant species
 - 30 years for potato, vine and trees
- No FSS remuneration at present

Number of protected cultivars (as on 30.03.2004)



Main objectives of plant breeding in Poland

- Yield
- Quality traits
- Winterhardiness
- Adaptability to other abiotic stress conditions: drought, acidity of the soil
- Resistance to diseases

Objectives of plant breeding researches

Resistance breeding

- a) *Fusarium* in wheat and triticale
 - new screening methods
 - introduction of new germplasm resistant to *Fusarium*

- b) *Septoria nodorum* in wheat and triticale
 - introduction of resistance genes via DH technics
- c) Brown rust in wheat and triticale
 - creation of new genetic sources combining resistance with other desired traits like baking quality or resistance to other diseases
- d) Mildew in wheat
 - introduction of new germplasm resistant to mildew
- e) Crown rust and viruses in barley
 - introduction of new germplasm resistant to mildew

Wheat baking quality

- a) new screening methods development:
 - capillary electrophoresis,
 - HMW glutenin electrophoresis of early generation,
- b) creation of new germplasm of high baking quality

Sprouting resistance in triticale

- a) wild species and other sources of resistance:
 - screening methods
 - molecular markers

Abiotic stress resistance

- a) aluminium tolerance in wheat:
 - screening methods
 - introduction of a new source of resistance
- b) wheat genetic background of the resistance to abiotic stress like lack of water and low doses of nitrogen

Broadening of genetic diversity in triticale and oats

- crosses with wild species
- crosses with 4x *tritico-secale*, *secale* and *triticum* sp.

Research projects in progress

- Improvement of wheat quality and definition of quality traits to discriminate end-use of European wheat (GFP)
- *Fusarium* resistance project
- Ethanol production from triticale project

The sources of financing research projects

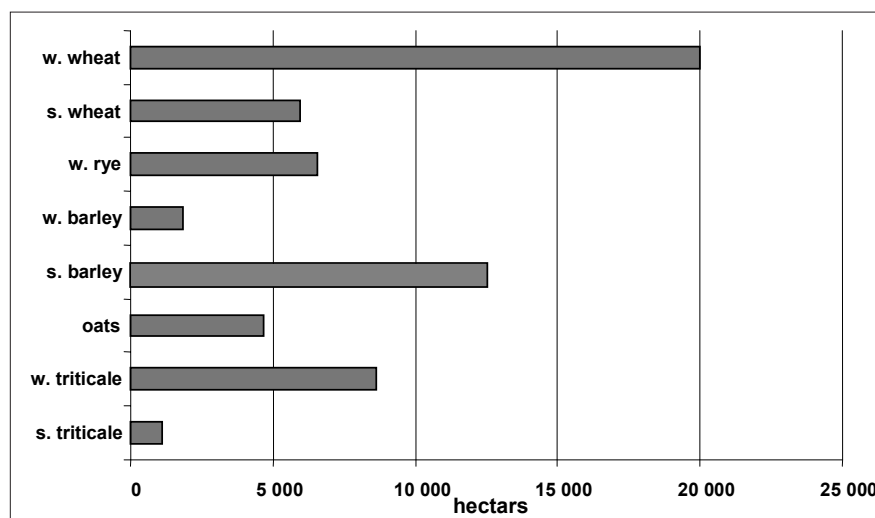
- a) private
- b) national grants
- c) EU grants

Plant Breeders in Poland

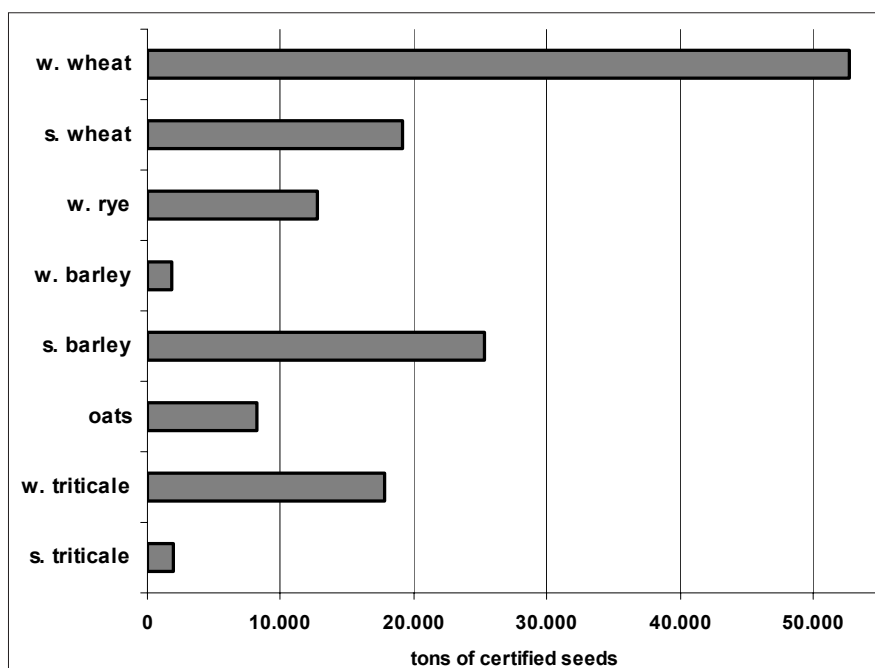
- domestic plant breeders: 50
 - state owned (mainly agricultural and vegetable crops)
 - ANR - Agricultural Property Agency
 - IHAR - Plant Breeding and Acclimatization Institute
 - other state research units or universities
 - private (ornamental and some others)
- international plant breeders: 140

Domestic Cereal Breeders in Poland

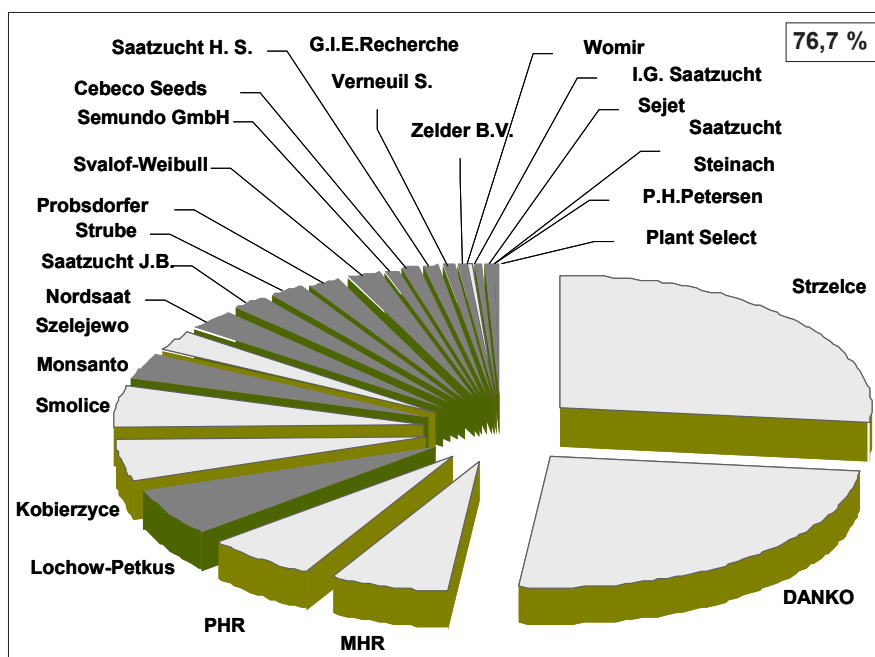
- DANKO Hodowla Roslin
- Hodowla Roslin Strzelce
- Poznanska Hodowla Roslin
- Nasiona Kobierzyc
- Hodowla Roslin Smolice
- Malopolska Hodowla Roslin
- Hodowla Roslin Szelejewo
- Womir



Cereal seed multiplications in Poland (ha)



Cereal seed production in Poland (t)



Cereal market share in Poland

Maize seed market in Poland

- Maize acreage for grain 487 000 ha
- Maize acreage for silage 162 000 ha
- 123 listed varieties as on 25.03.2004

Rape seed market in Poland

- Oil seed rape acreage 454 000 ha
- 15 listed spring varieties
- 38 listed winter varieties as on 25.03.2004

Sugar beet seed market in Poland

- Sugar beet acreage: 322 000 ha
- 67 listed varieties as on 25.03.2004

Potato seed market in Poland

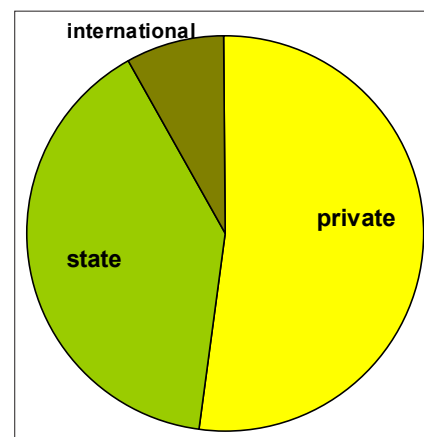
- Potato acreage: 867 000 ha
- 113 listed varieties as on 25.03.2004

Domestic breeders of pulses in Poland

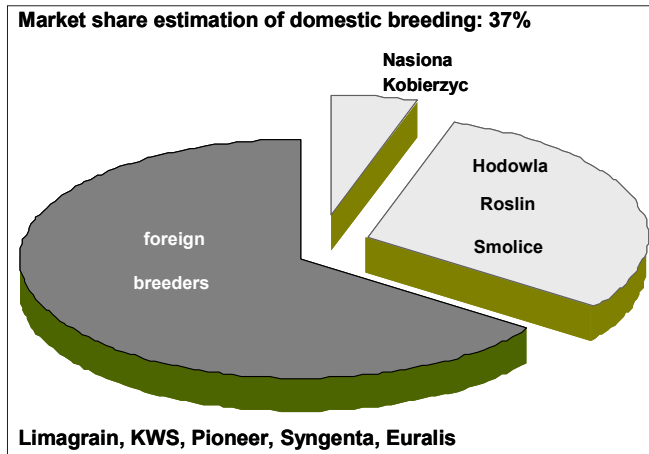
- Peas:
 - Hodowla Roslin Szelejowo
 - Poznanska Hodowla Roslin
 - Hodowla Roslin Smolice
- Lupines:
 - Poznanska Hodowla Roslin
 - Hodowla Roslin Smolice
- Field Bean:
 - Hodowla Roslin Strzelce
 - Hodowla Roslin Szelejowo
 - DANKO Hodowla Roslin

Grass market in Poland

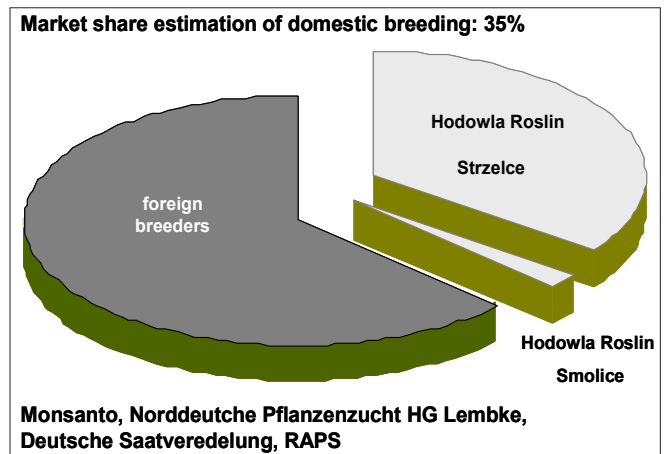
- Domestic breeders:
 - Hodowla Roslin Szelejowo
 - Poznanska Hodowla Roslin
 - Malopolska Hodowla Roslin
 - Womir
 - IHAR
- International breeders:
 - Barenburg
 - Cebeo Seeds
 - DSV
 - DLF Trifolium



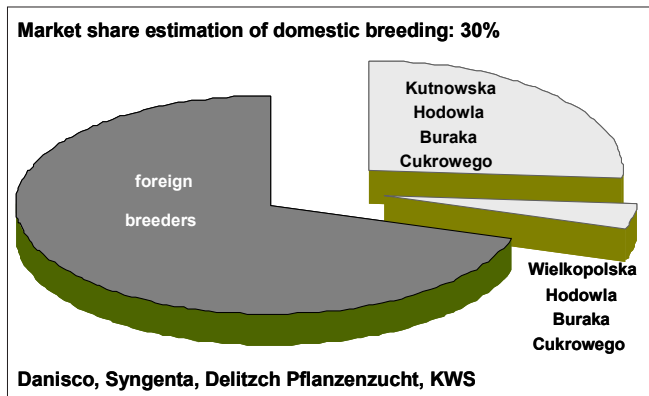
Seed enterprises in Poland - The estimation of the share of different seed sectors in the cereal seed selling



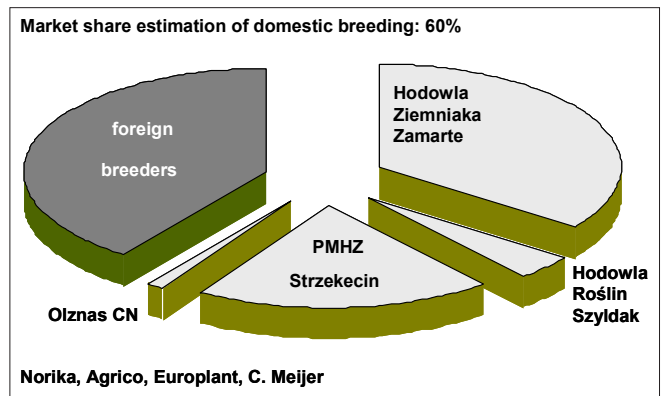
Maize market share in Poland



Rape seed market share in Poland



Sugar beet seed market in Poland



Potato seed market in Poland

Domestic breeders of vegetables in Poland

- Spójnia Nochowo
- Plantico Golebiew
- Plantico Zielonki
- Polan Kraków
- Polan Gdansk-Wieniec
- Instytut Warzywnictwa Skierniewice
- Krzeszowice

cucumber, tomato, red beet, carrot, parsley, lettuce, bean

Plant Breeder's and Seed Industry organizations

PIN - Polish Seed Trade Association

- 92 Members
- Sections
 - Plant Breeder's
 - Potato

– Sugar Beet

– Maize

– Vegetable and Ornamental Crops

– Grasses and long-term legumes

www.pin.ogr.pl

AN - Seed Agency

- controlling of licence agreements
- legality of seed trade
- FSS remuneration?

