

Seed Type Sold in the World Market



1. OP (open pollination) type
2. F_1 hybrid (crossing elite lines)
3. GM (genetically modified) seed (F_1)

Changes in World Seed Market Magnitude

World Seed Market

1975	1985	1996	2006	2009	2010	2011	2012	2015	2020	year
12.0	18.0	30.0	34.0	38.0	42.0	43.0	45.0	48.2	61.5	B\$

[ISF(International Seed Federation) 2013, NWB]

CAGR: 3-5%

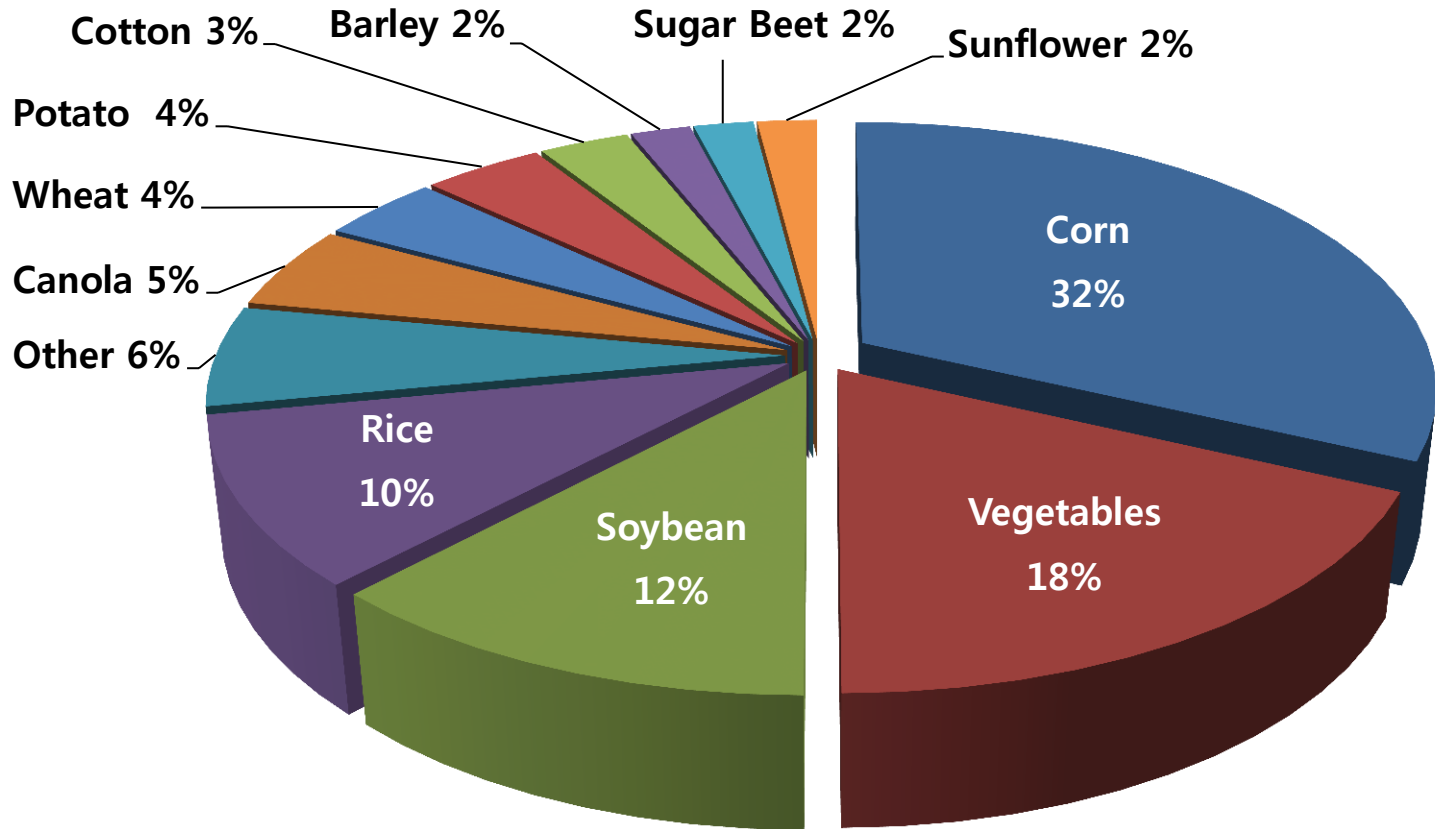
World GM Seed Market

1996	1998	2000	2004	2006	2008	2009	2010	2011	2012	2013	2014	year
0.09	1.51	2.42	5.10	6.70	9.04	10.48	11.70	13.20	14.60	15.60	15.70	B\$

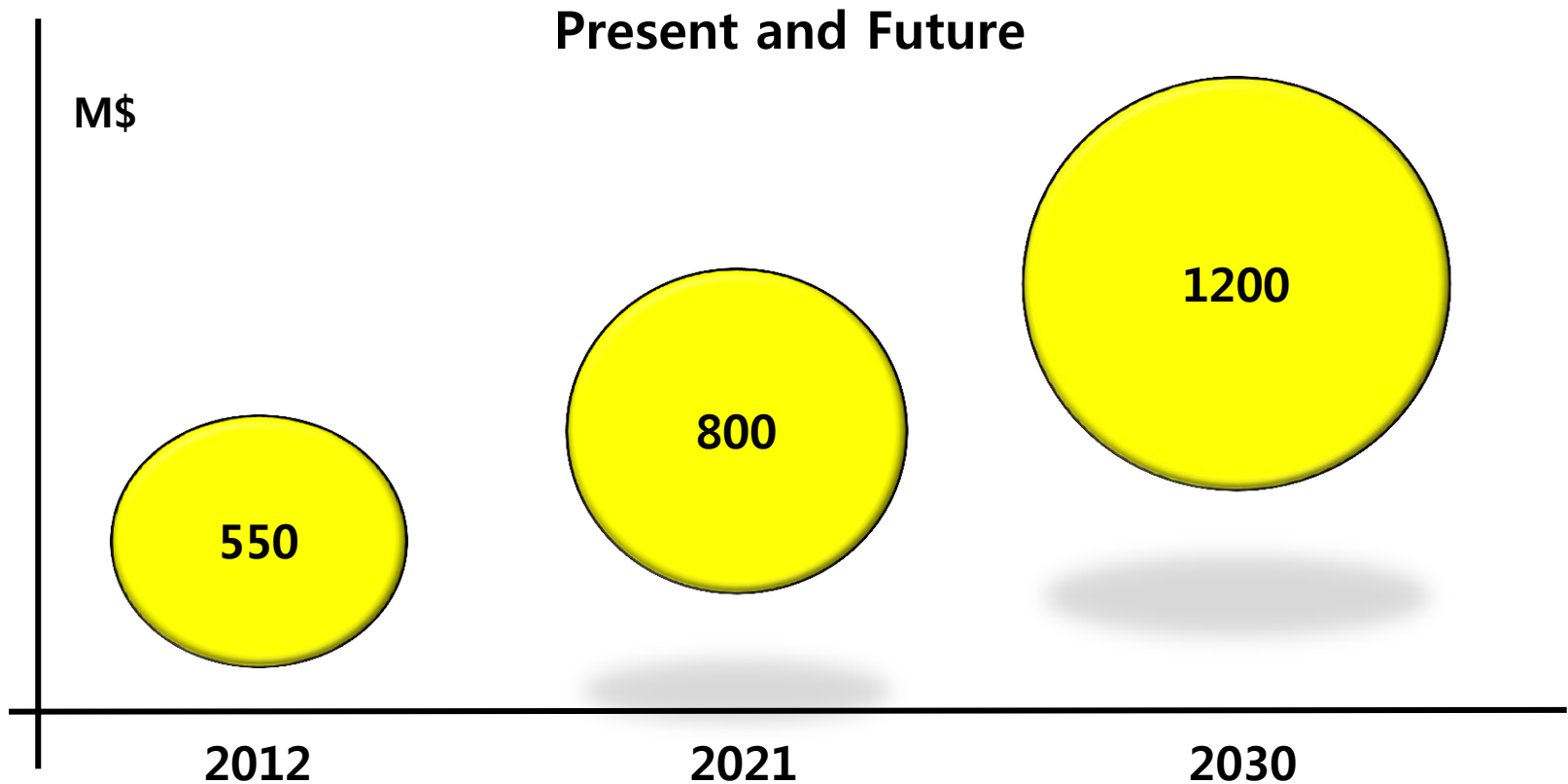
Global market value of biotech crops = biotech seed + technology fee (ISAAA, 2014)

GM seed of total seed market: 33%

Global Seed Market Distribution

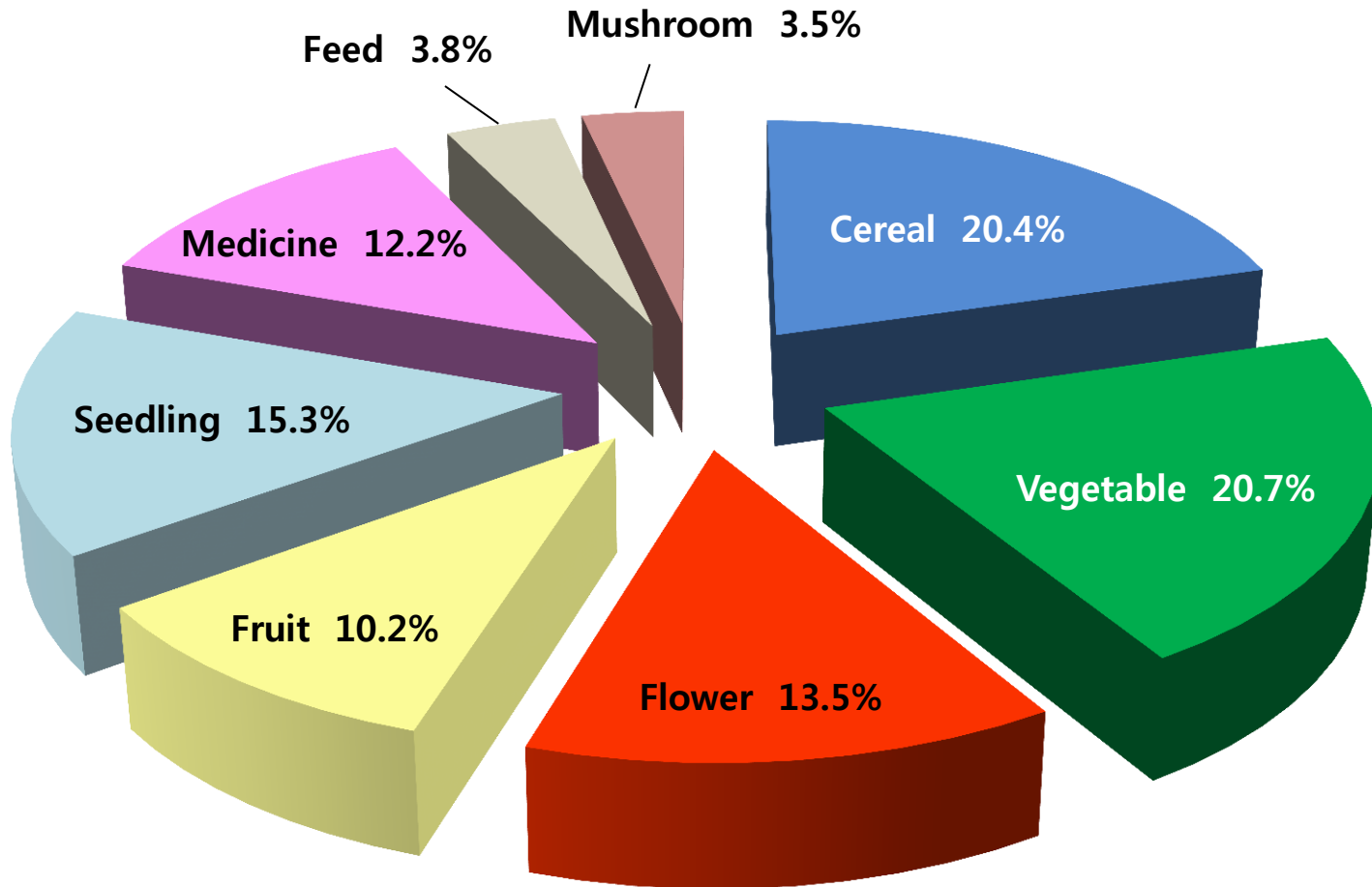


Seed Market in Korea



- Seed from cereals, horticultural crops, medicinal plants & etc.
- Annual growth rate: 5%
- 1.2% of global seed market.

Seed Market Composition



Korean government controls the cereal market .

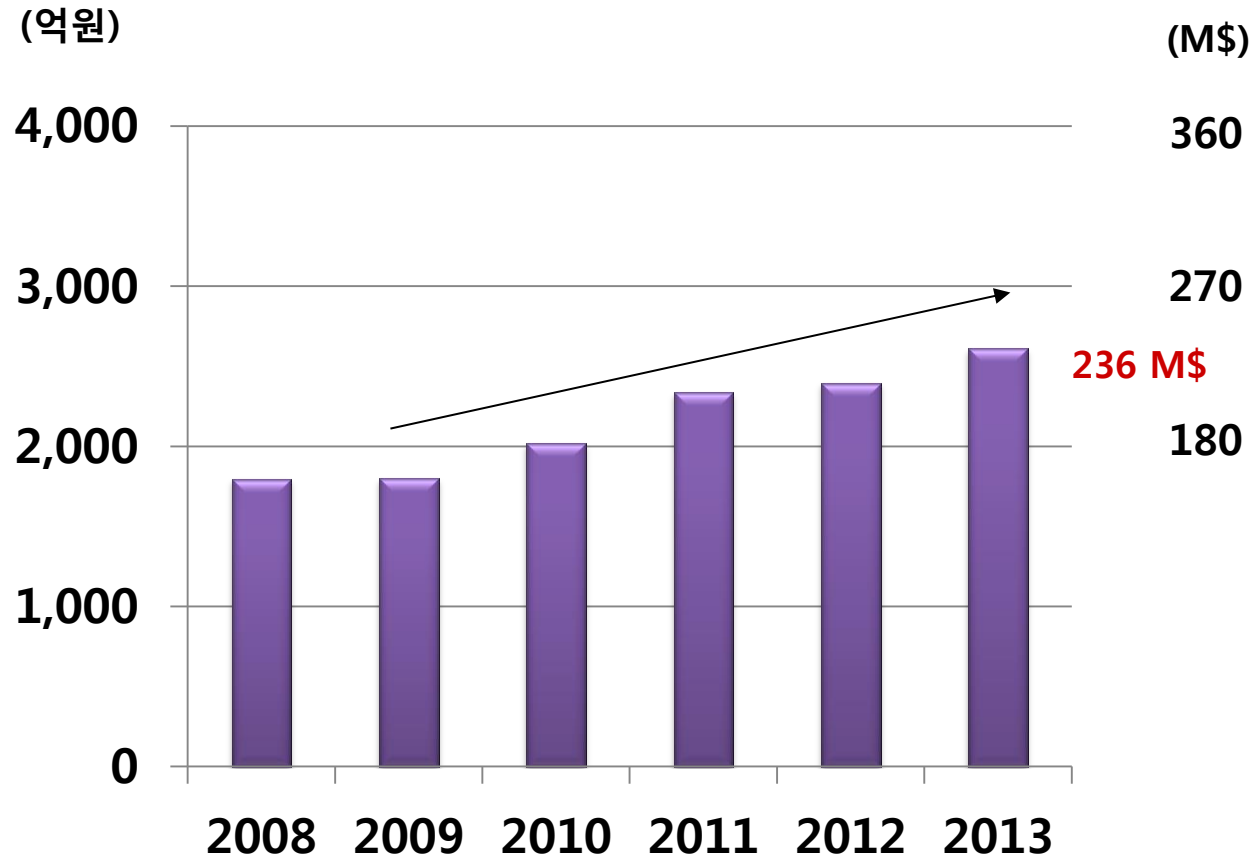
(RDA, 2013)

General Process of Seed Business



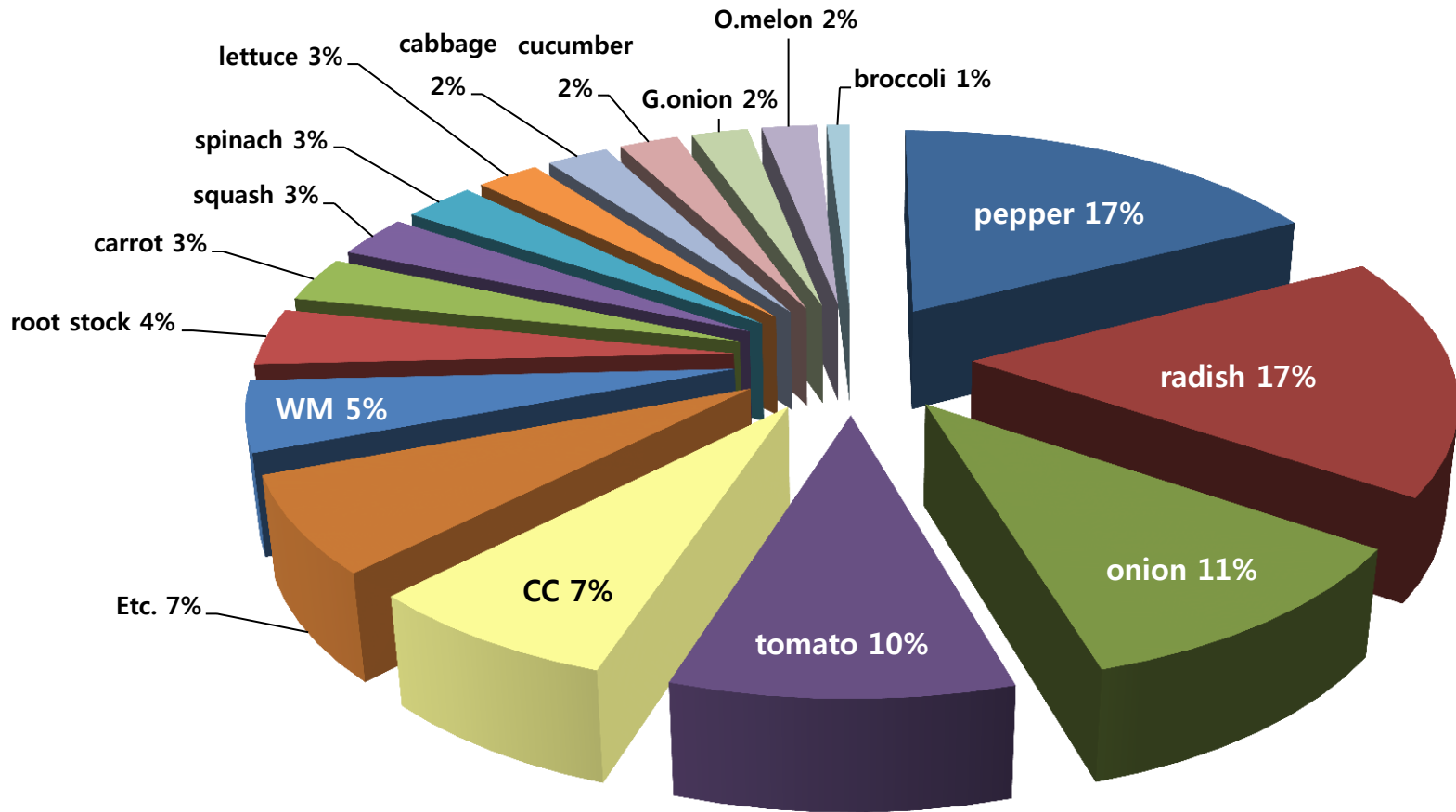
It takes 7-10 years to get one variety!

Vegetable Seed Market Growth in Korea



Annual growth rate: 7.5%

Magnitude of Seed Sales (vegetable)

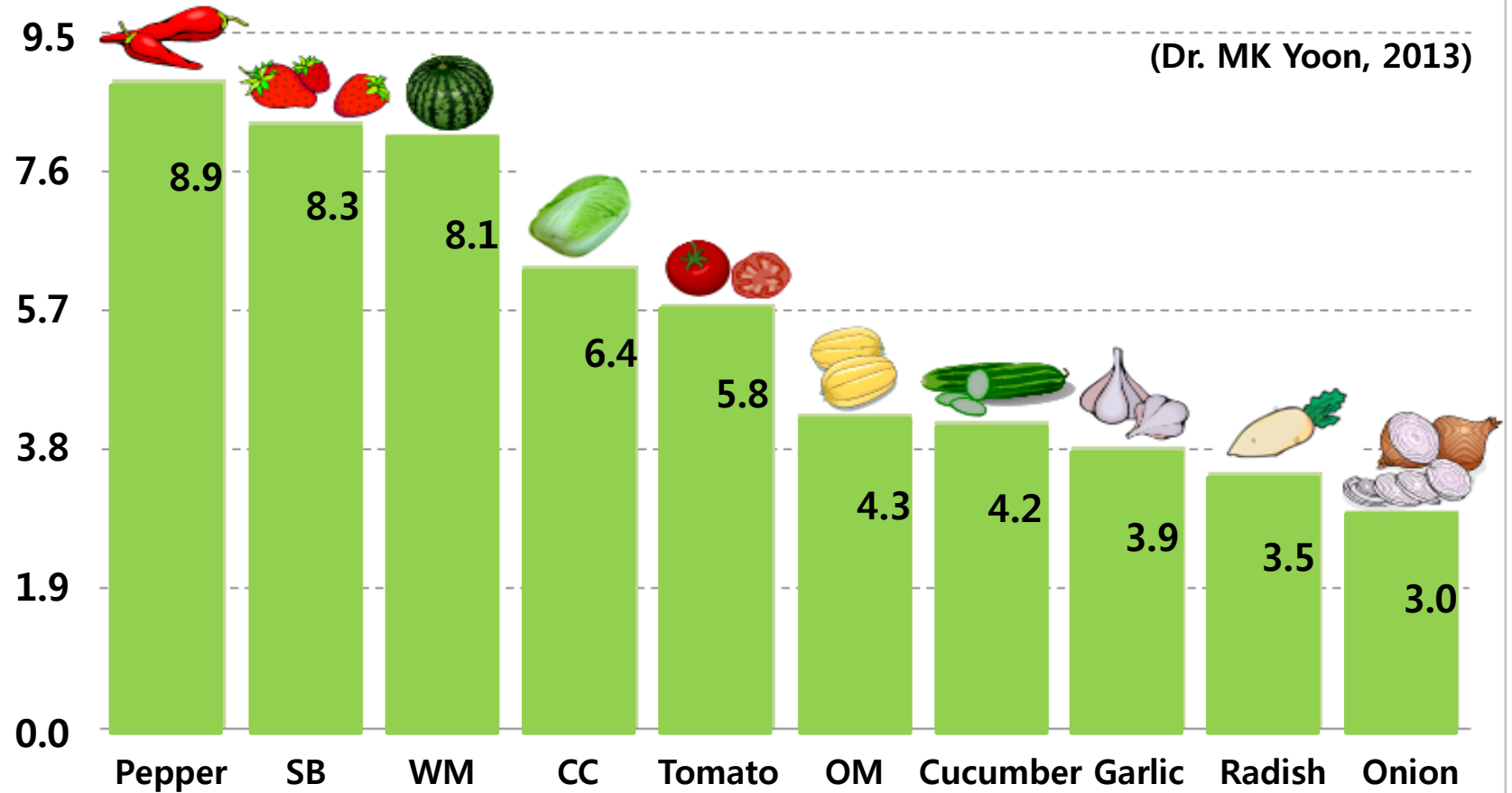


-Vegetable seed market in 2014: \$230M
-1% = \$2.3M

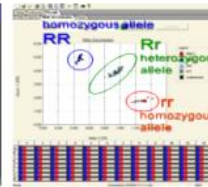
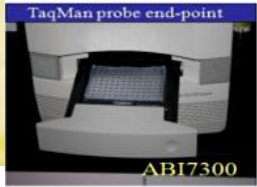
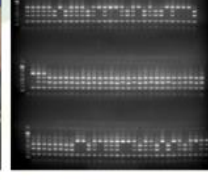
(KSA, 2015)

Production Value of Crops (average of 2007-2011)

100M\$



A total vegetable produce market: ~9.5B\$ (2013)



Vegetable Seed Company

Employee: 430 (domestic)

**Annual Sale
1st ranked in Korea**

**Nongwoo
Bio Co.**

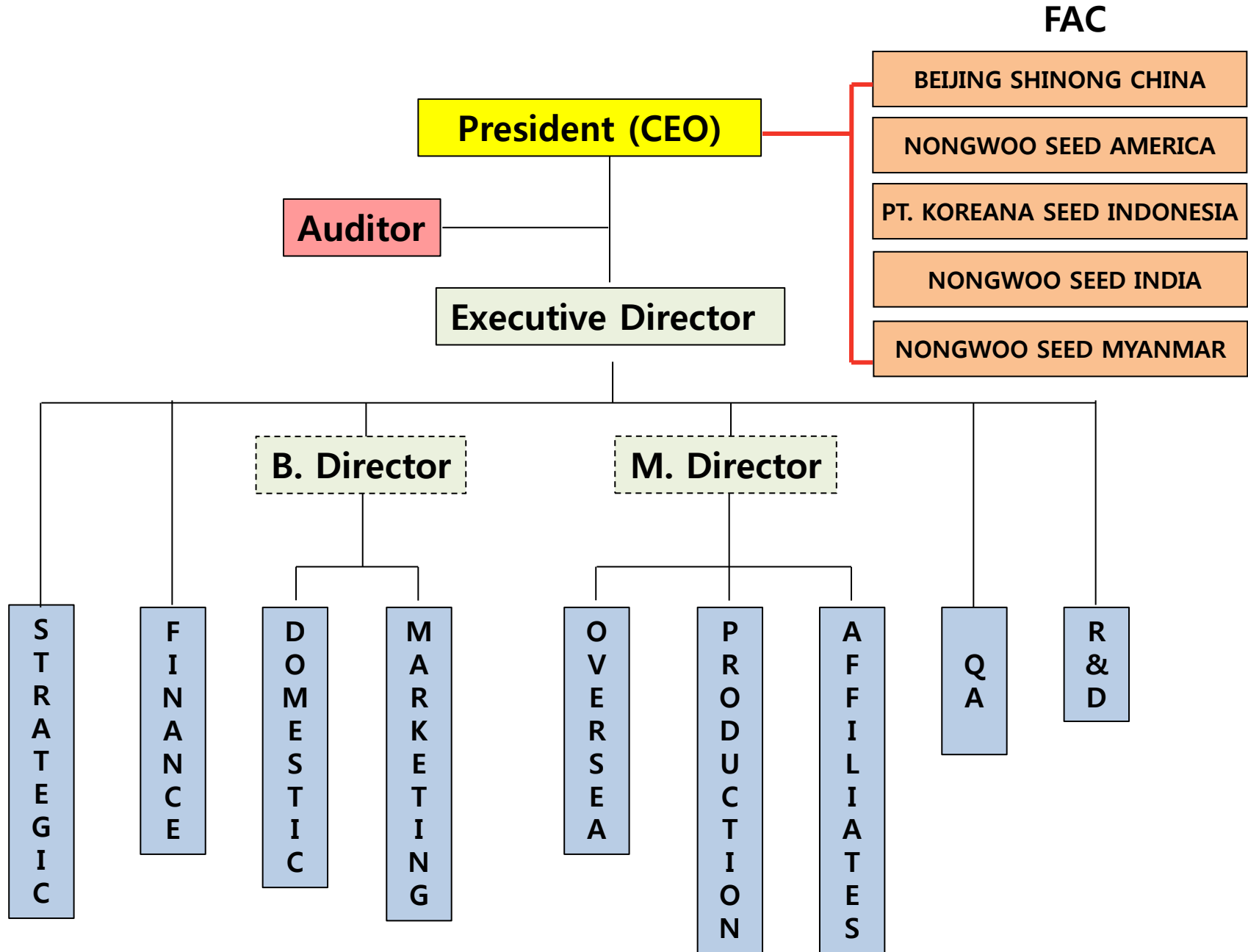
KOSDAQ (since 2002)

Agbiotech R&D

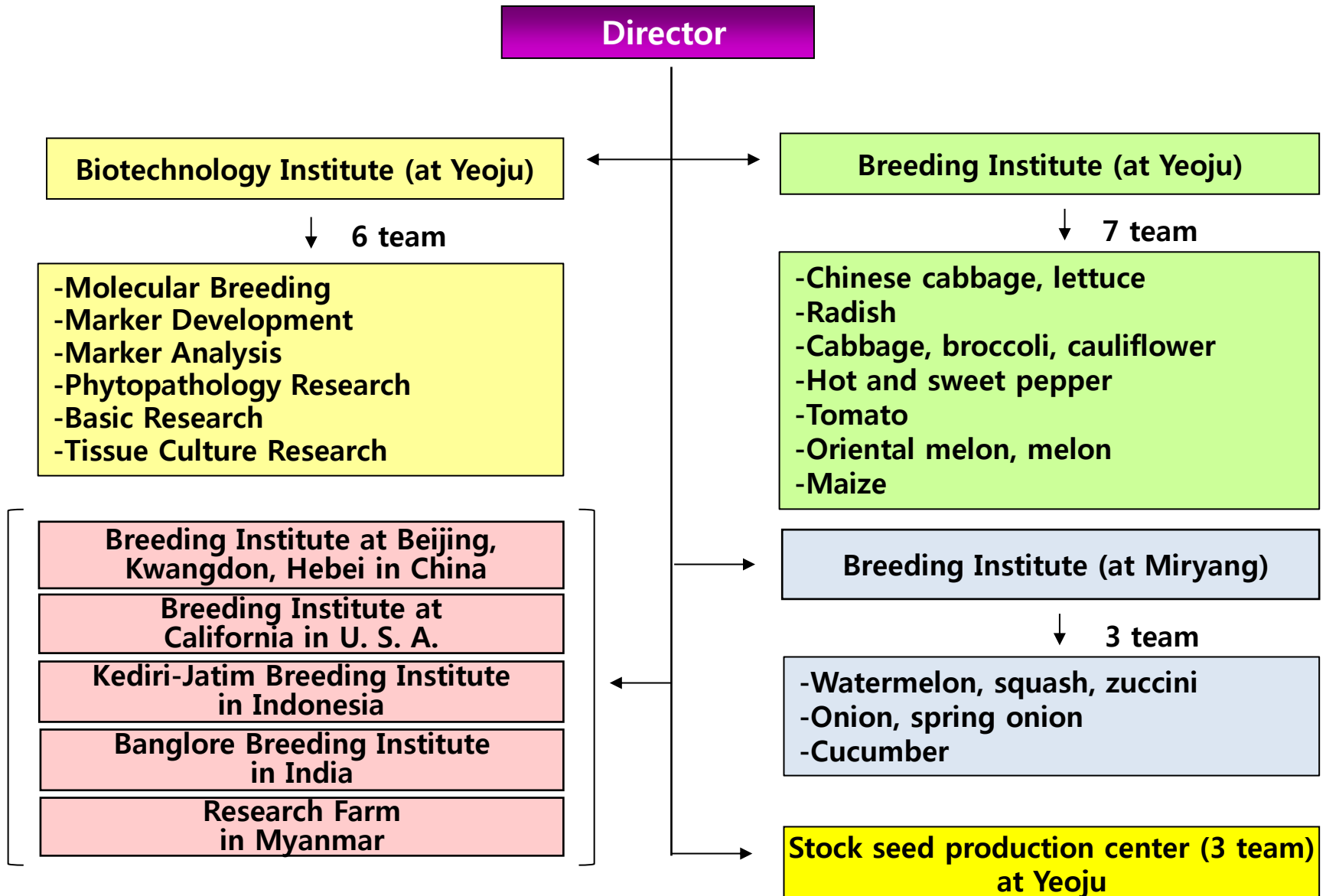
An affiliate of NH

NWB was merged with NH on Sept. 1, 2014

Organization of NWB

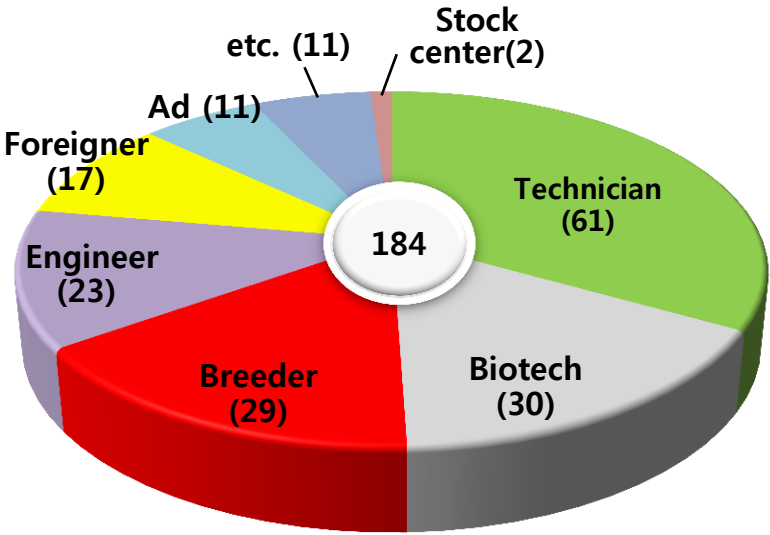


Organization of R&D



3 institutes & 1 center

Human Resources for R&D (domestic)



R. Scientist: 61

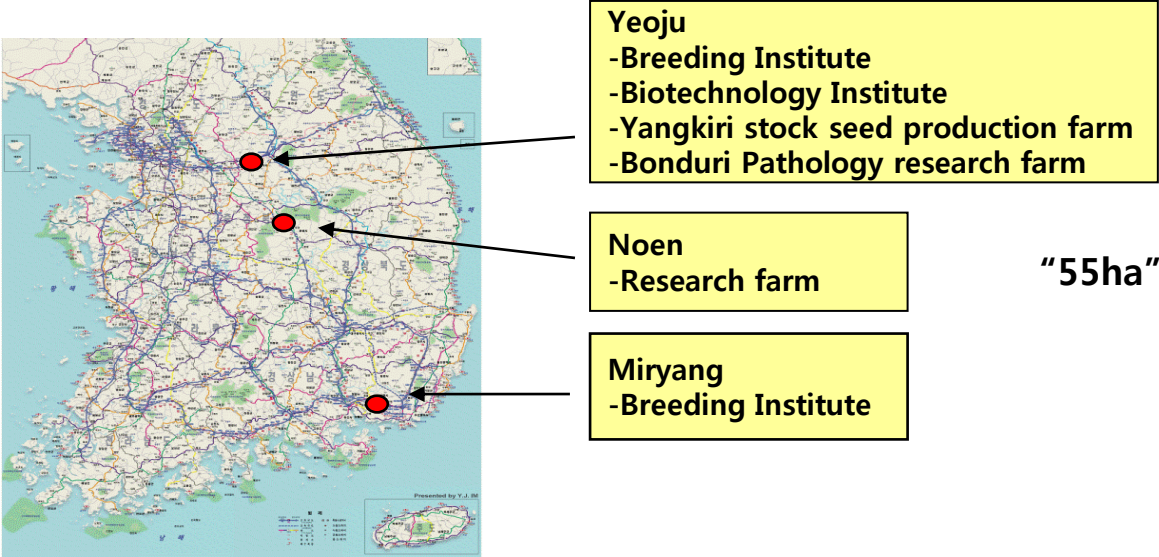
Breeder: 29
Biotech. S.: 30
Stock center: 2

PhD: 17
MS: 27
BS: 17



Location of R&D Institute and Farm

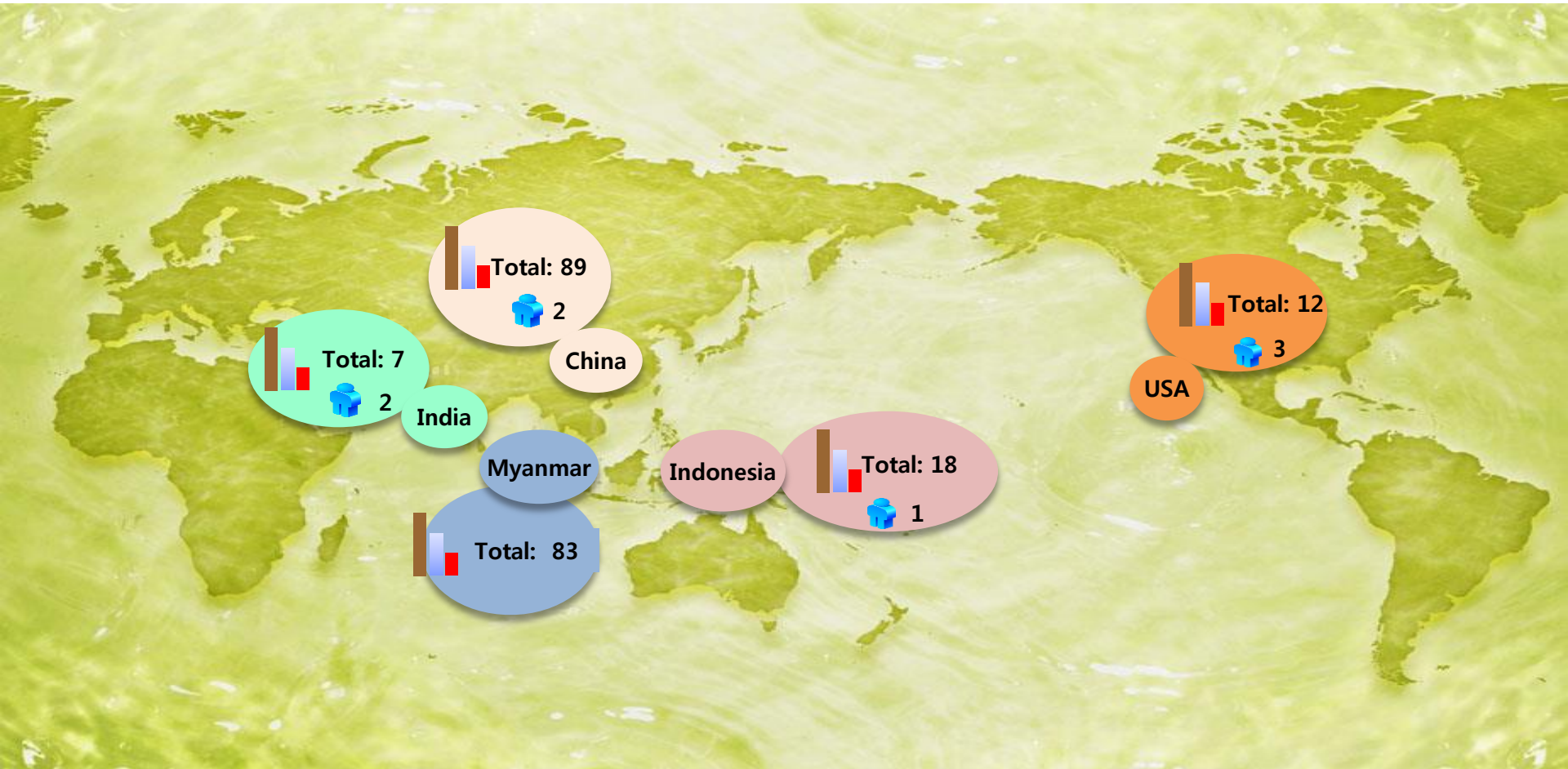
Domestic



Foreign



Cultivation Area and No. of Research Scientist Abroad

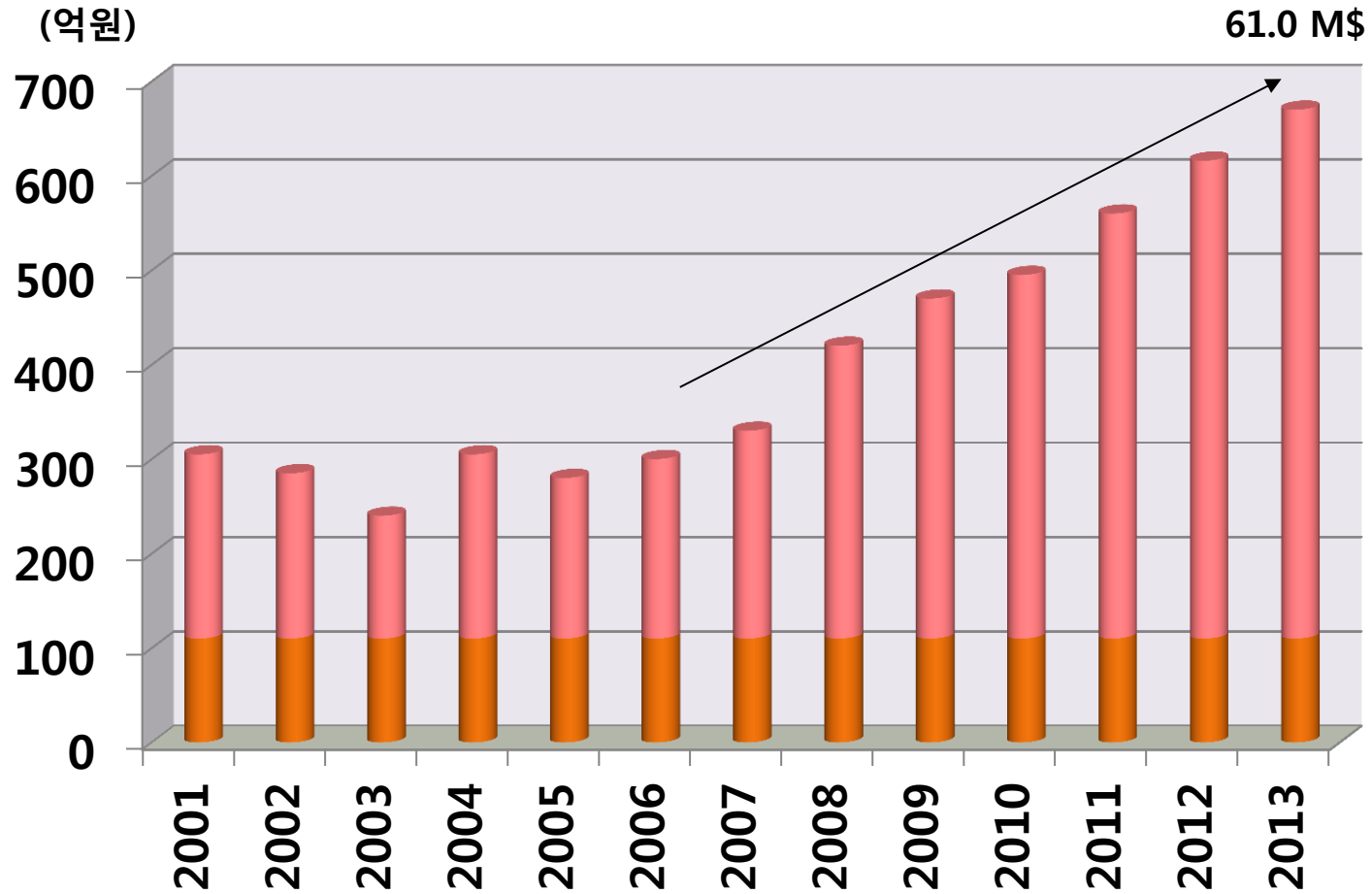


Area (ha)



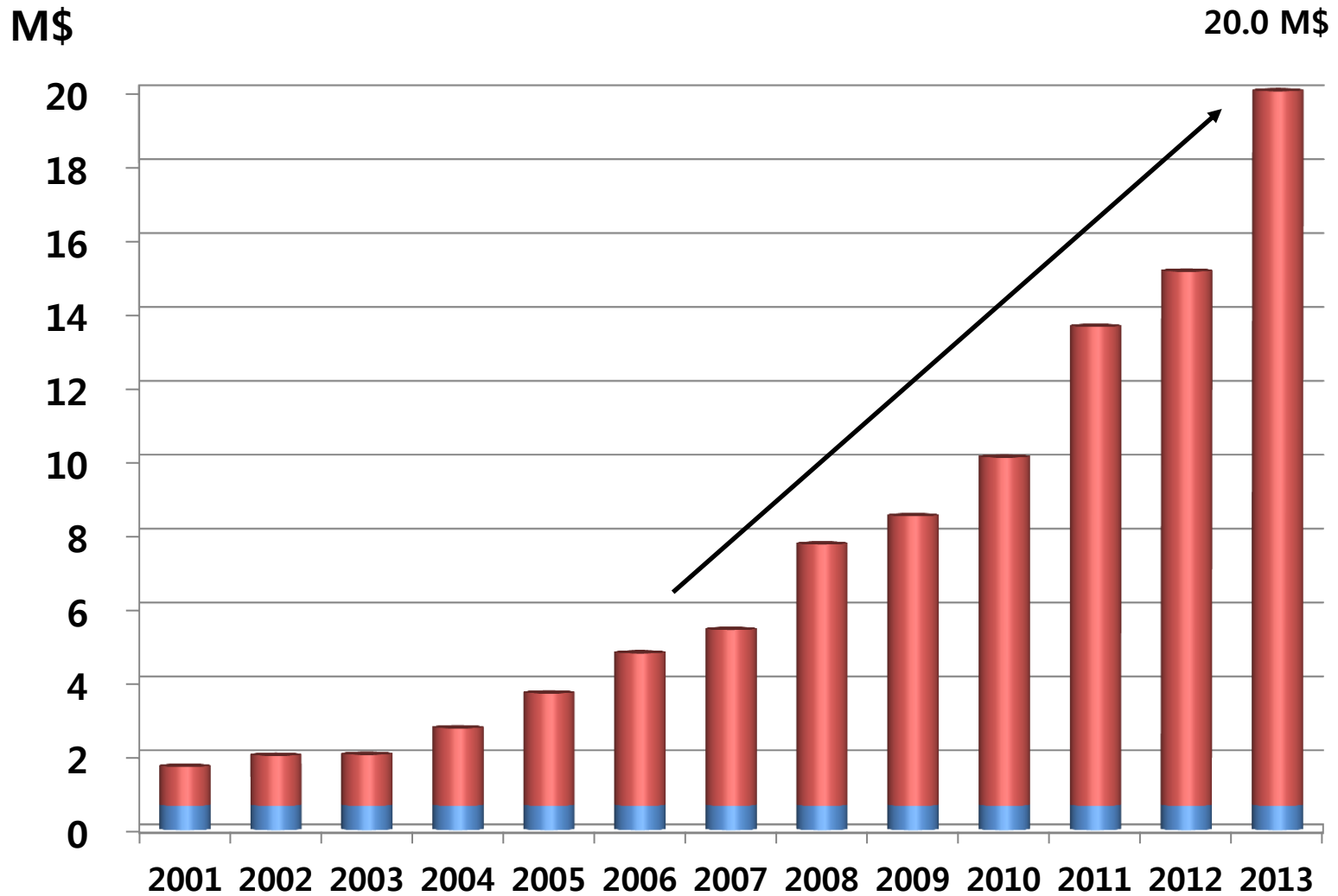
Breeder: 8

Annual Turnover of NWB



65M\$ in 2014 (net profit: 20%)
Global total: 85M\$ in 2014

Sales Magnitude from Exporting



25M\$ in 2014

Vegetable Seed Sales of Seed Companies

Company	2012 (M\$)
Monsanto	851
Limagrain	756
Syngenta	682
Nunhems	410
Rijk Zwaan	340
Sakata	295
Takii	267
Enza Zaden	233
Bejo Zaden	178
East West	120
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NWB	85 (global)
Kaneko	75

ranked 13-14

Cf) World vegetable seed market: \$5B (2012)

Breeding Institute (domestic)



Objective: development of elite seeds (F_1 hybrid)

Yeoju Institute (7 team):

- Chinese cabbage, lettuce
- Radish, carrot
- Cabbage, broccoli, cauliflower
- pepper
- Tomato
- Oriental melon, melon
- Cucumber
- Maize

Miryang Institute (3 team):

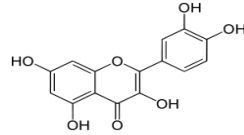
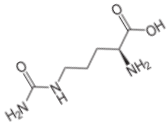
- Watermelon, rootstock, squash, zucchini
- Onion, spring onion
- Cucumber

500 F_1 varieties are sold in the market every year



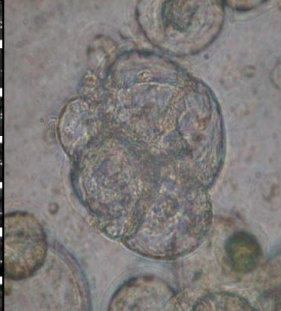
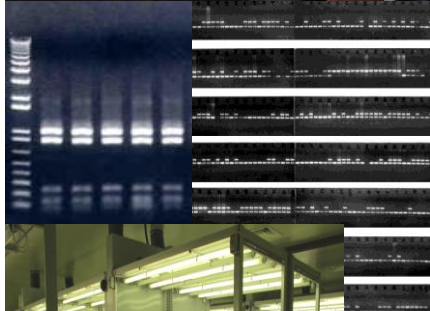
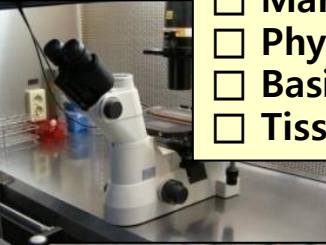
Since 1998, about 1000 varieties have been developed.

Biotechnology Institute



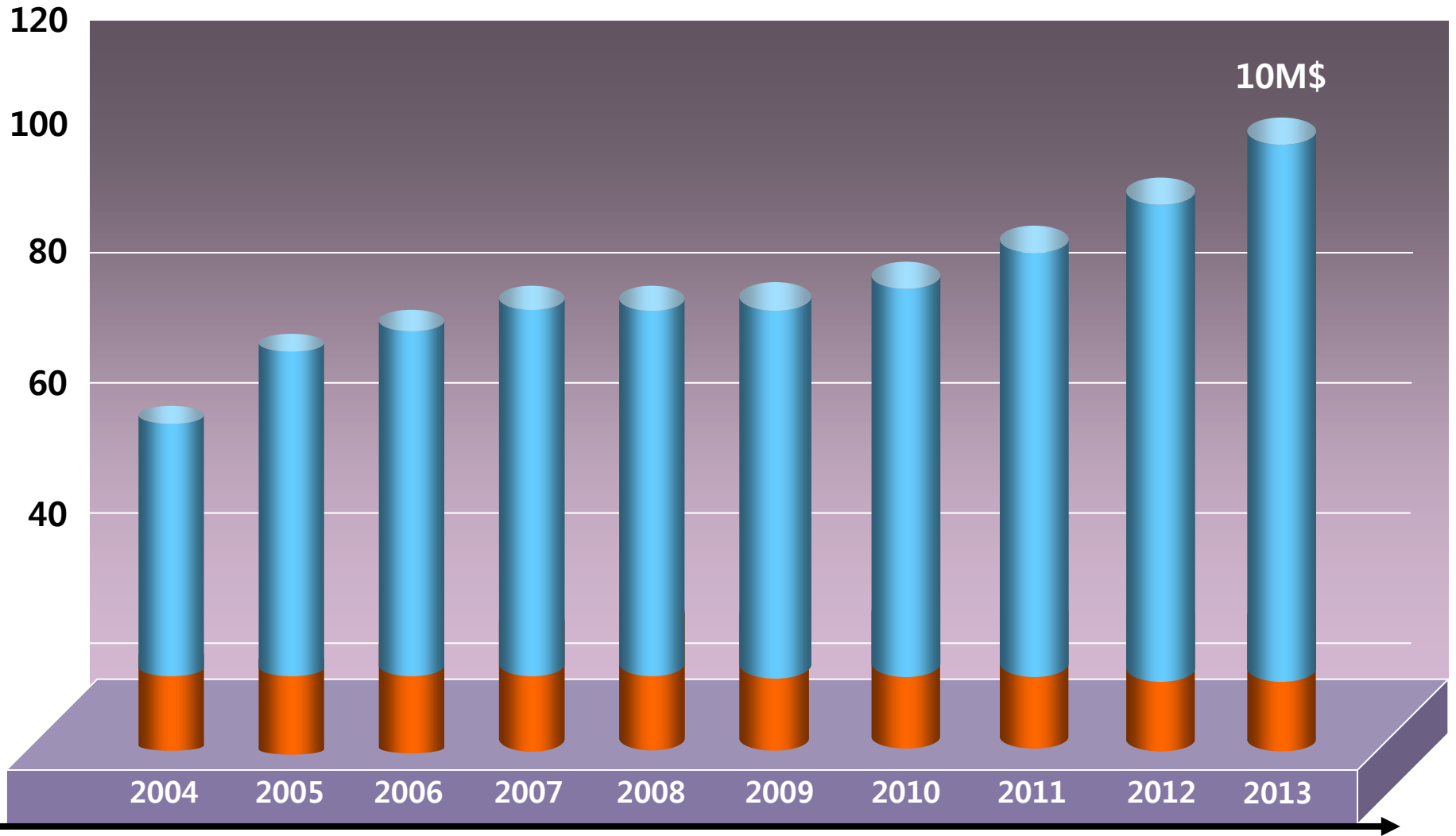
Objective:
-Provide breeding tools and new genetic sources

- Molecular Breeding
- Marker Development
- Marker Analysis
- Phytopathology Research
- Basic Research
- Tissue Culture Research



R&D Budget (domestic)

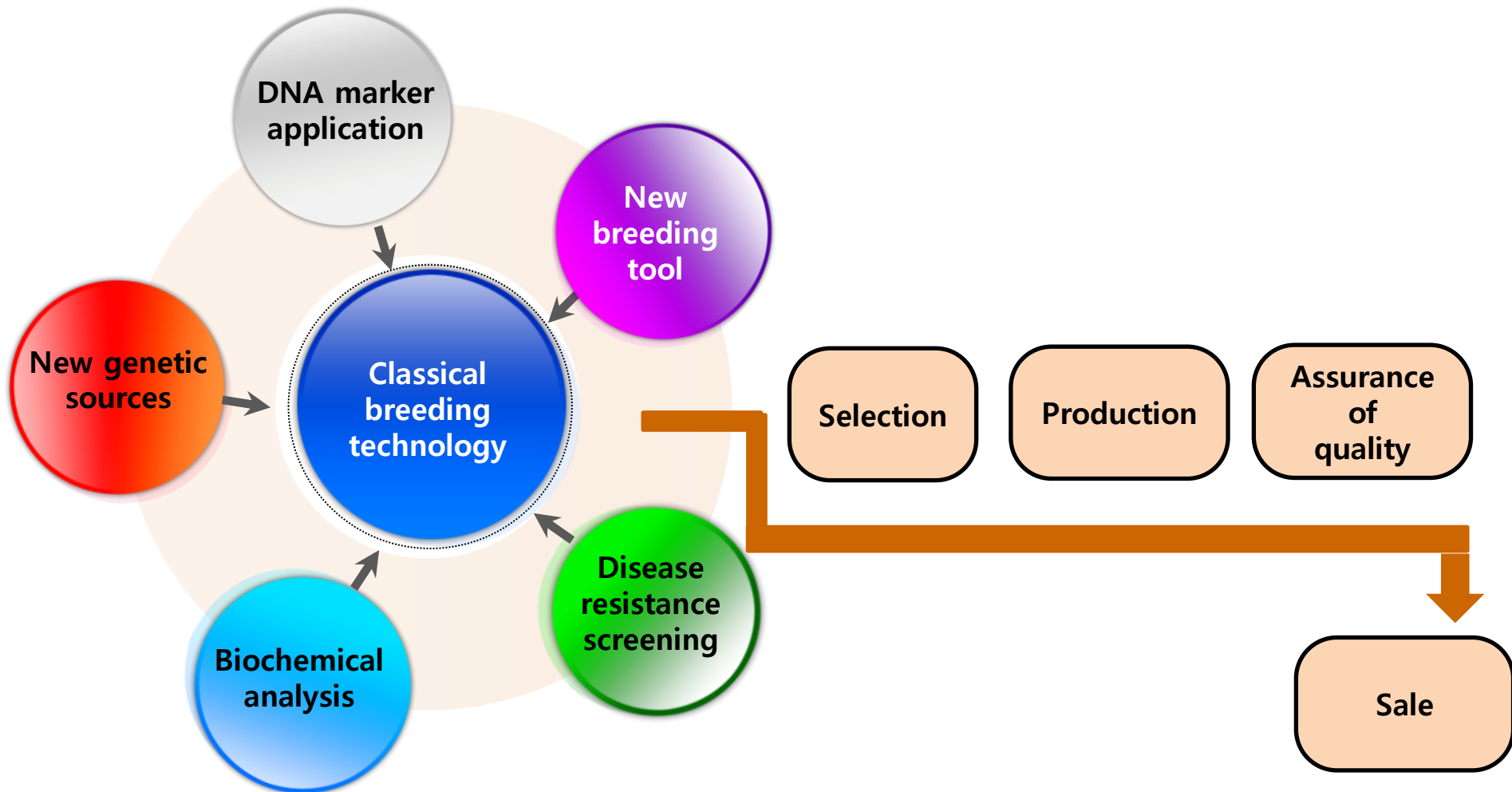
(억원)



10M\$

11M\$ in 2014, 12M\$ in 2015
(In addition, 2.5M\$ from Government)

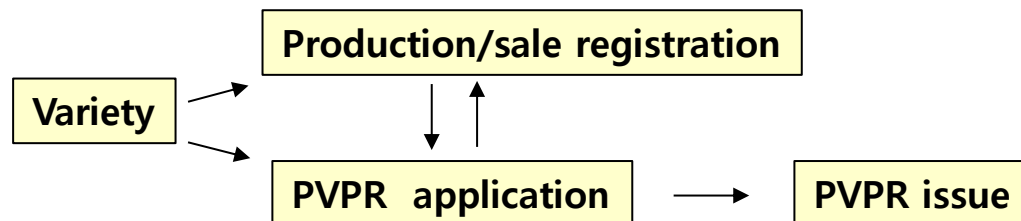
A Pipeline through Technology Combination



IP

1) PVPR

Crop	Number of Varieties (PVPR issue)	Crop	Number of Varieties (PVPR issue)
Radish	71 (31)	Watermelon	32 (18)
Chinese cabbage	42 (26)	Carrot	8
Cabbage	18 (1)	Onion	28
Pepper	109 (18)	Green onion	8
Tomato	19 (5)	Lettuce	15 (9)
Cucumber	20 (12)	Spinach	16
Oriental melon	11 (8)	Others	148 (6)
Pumpkin	37 (6)	Total	582 (132)



For last 10 yrs (2003-12)

2) Patent

	Application		Registration	
	Domestic	Foreign	Domestic	Foreign
since 2003	10	1	11	5

Vision 2020

Vision

"Global Top 10 in 2020"

Goal

**One of the world's leading
companies in the vegetable seed
industry**

180M\$ (2020)

*Core
value*

**Customer
centered**

Global

Change

**R&D
focused**

**Environmental
friendly**

