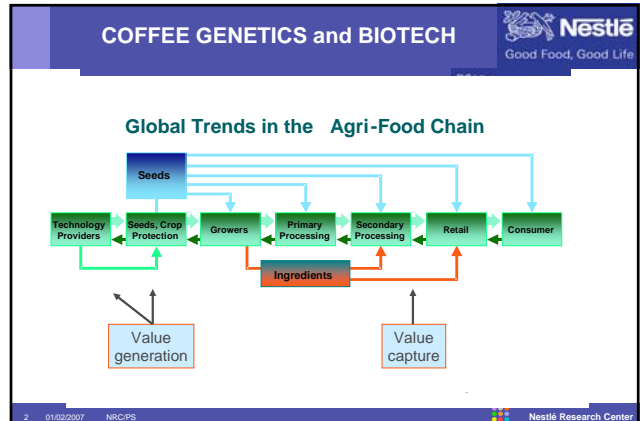

Good Food, Good Life


POSSIBLE IMPACTS of GENETICS and BIOTECHNOLOGY on the COFFEE SUPPLY CHAIN and INDUSTRY

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ICO - London January 2007

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COFFEE GENETICS and BIOTECH

Three main possible impacts


- field performances and yield : decrease of **production costs**
➔ predominance of some producing countries
- factory and cup performances: **product differentiation**
➔ de-commoditization for some niche products
- fully enforceable **identification of raw material up to the shelf**
➔ possible enforcement of IP rights on proprietary raw materials

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Recent developments within UPOV

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WHAT IS UPOV?


The International **Convention** for the Protection of New Varieties of Plants established

The International **Union** for the Protection of New Varieties of Plants

Union internationale pour la protection des obtentions végétales



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THE UNION

- Members of the Union
 - States or Intergovernmental Organizations
- Permanent Organs of the Union
 - The Council - consisting of the representatives of the members of the Union
 - The Office of the Union - carries out all the duties and tasks entrusted to it by the Council

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UPOV

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Criteria to be satisfied

- NOVELTY
- DISTINCTNESS
- UNIFORMITY
- STABILITY

“DUS” (DHS)

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UPOV

UPOV Membership/Territories covered

33 members of the 1991 Act

2/1/2007

UPOV

UPOV Membership/Territories covered

61 members

2/1/2007

UPOV

Members of UPOV (green) and initiating States and organizations (yellow)

Initiated the Procedure

- 17 States
- 1 intergovernmental organization

2/1/2007

UPOV

Test Guidelines to be discussed by the TWA in 2007

Species	Basic Document	Leading expert(s)	Interested experts (countries)
Coffee*	TG/COFFEE (proj.4)	Luis Gustavo Asp Pacheco (BR)	KE, MX
Festulolium* (Festuca / Lolium hybrids)	TG/FESTL (proj.2)	Michael Camlin (GB)	AR, CZ, DE, DK, FR, HU, NL, NZ, QZ, ZA
Lotus (Revision)*	TG/193/1(proj.3)	Carlos Gómez (UY)	AT, DE, FR, GB, NZ
Maize (Revision)*	TG/2/7(proj.1)	Joel Guizard (FR) / Tamás Harangó (HU)	AR, AT, BG, BR, CA, CN, CZ, DE, ES, KE, KR, MX, NL, PL, QZ, SK, UA, ZA
Pea (Revision)*	TG/7/10(proj.2)	Niall Green (GB) TWV	CA, DE, DK, ES, FI, FR, GB, HU, NL, NZ, PL, QZ, ZA
Pearl Millet*	TG/PRL_MIL (proj.3)	Luis Gustavo Asp Pacheco (BR)	AT, ES, FR, KE, MX, UA, RU.
Sesame*	TG/SESAME (proj.2)	Baruch Bar-Tel (IL)	BG, BR, CN, JP, KR
Sweet potato (<i>Ipomoea batatas</i> (L.) Lam.)	TG/SWEETPOT (proj.1)	Keun-Jin Choi (KR)	CA, CN, NZ, JP, KE, ZA
Tea*	TG/TEA(proj.2)	Lin Xiangming (CN)/ Evans O. Sikiyi (KE) (joint leading experts)	BR, JP, KR

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COFFEE GENETICS and BIOTECH

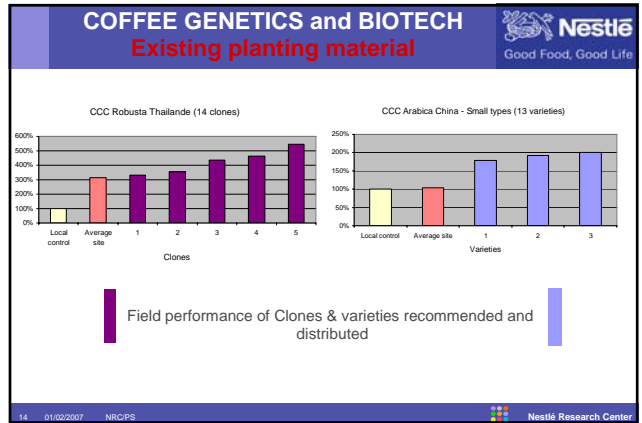
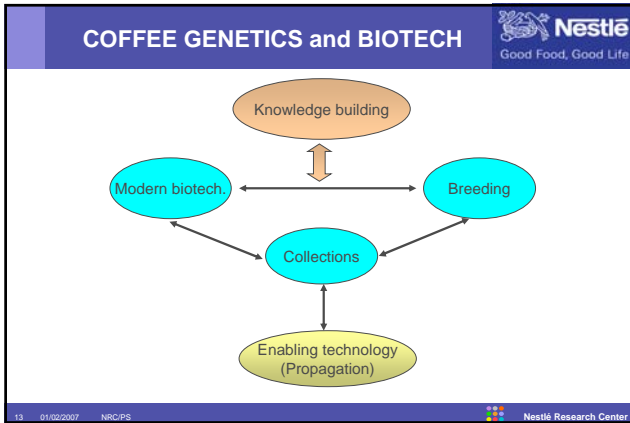
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Three complementary approaches

- Better knowledge and use of existing planting material
- Conventional breeding guided by DNA markers (MAS)
- Modern biotechnology for tailor made improvement

Time ↓ IP Value ↓

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GENETICS and BIOTECH

Existing planting material

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Category	Number of years of selection	Varieties
Selected	3/3	7,14
Potentially interesting	2/3	2,3,5,33
Good but not selected	1/3	1,18,36
Common	1/3	6,8,9,10,11,12,17,19,20,22,25,27,28,29,35,56
Bad	0/3	4,13,16,23,34,55

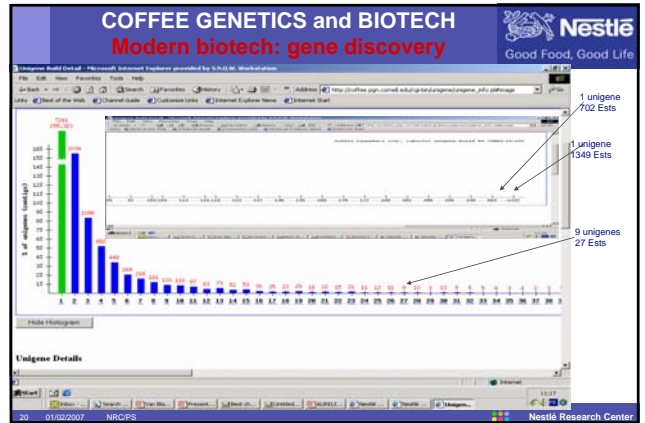
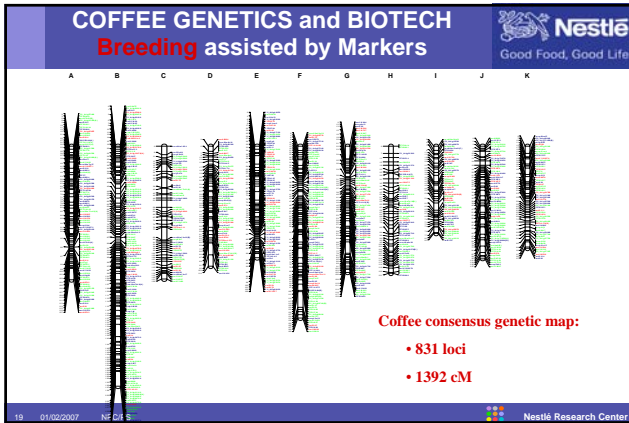
cup performance: 3 years of evaluation at Nespresso

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B. Nestlé evaluation

I. Agricultural traits

	ECUADOR	MEXICO	PHILIPPINES	THAILAND
Location
Plant density (plants/ha)	24	25	25	25
Planting date (DD/MM/YY)	01/01/05	01/01/05	01/01/05	01/01/05
Harvesting date (DD/MM/YY)	15/08/05	15/08/05	15/08/05	15/08/05
Harvesting method
Yield parameters
Yield (kg/ha)	4200	4200	4200	4200
Yield (kg/plant)	175	175	175	175
Yield (kg/ha) @ 1500m
Yield (kg/plant) @ 1500m
Yield (kg/ha) @ 1800m
Yield (kg/plant) @ 1800m
Yield (kg/ha) @ 2100m
Yield (kg/plant) @ 2100m
Yield (kg/ha) @ 2400m
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Yield (kg/ha) @ 34800m



COFFEE GENETICS and BIOTECH

Modern biotech: gene discovery

Sharing a Common Gene Repertoire

- 47,000 coffee cDNA clones computationally assembled to 13,175 unigenes
- 21% of the coffee unigenes had **no clear match in Arabidopsis**
- 90% of the coffee genes, lacking a match in Arabidopsis, **do have a match in Solanaceae EST databases (tomato, potato, pepper, eggplant)**

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