WHERE IS THE VALUE PROPOSITION OF NEW CULTIVARS? WHO ARE THEY FOR?

RODRIGO CRUZAT
BIOFRUTALES CONSORTIUM

Mobile: +56 9 94891608
rcruzat@biofrutales.cl

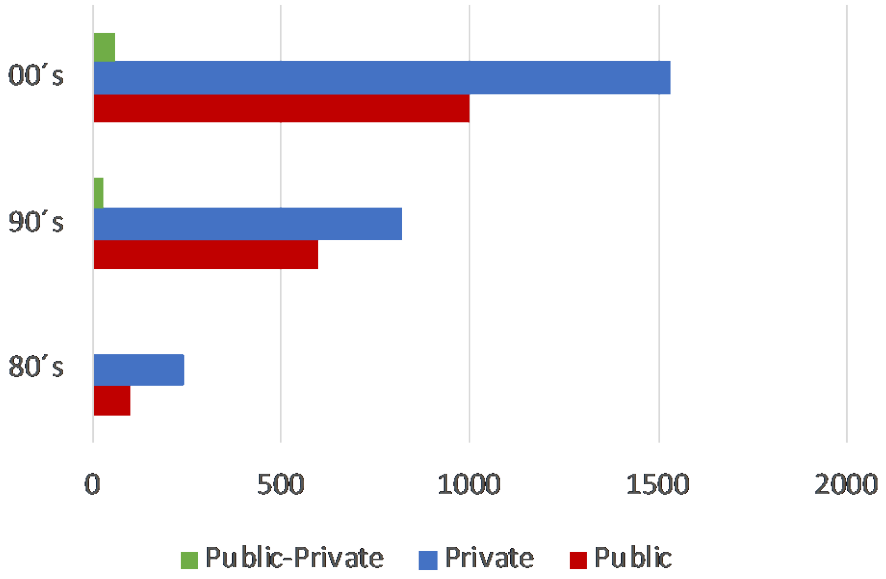
INTERNATIONAL CONGRESS ON CITRUS NURSERIES

CALIFORNIA, US - SEPTEMBER 29 - OCTOBER 6, 2022

ISCN & CCNS

Where are fruit cultivars coming from?

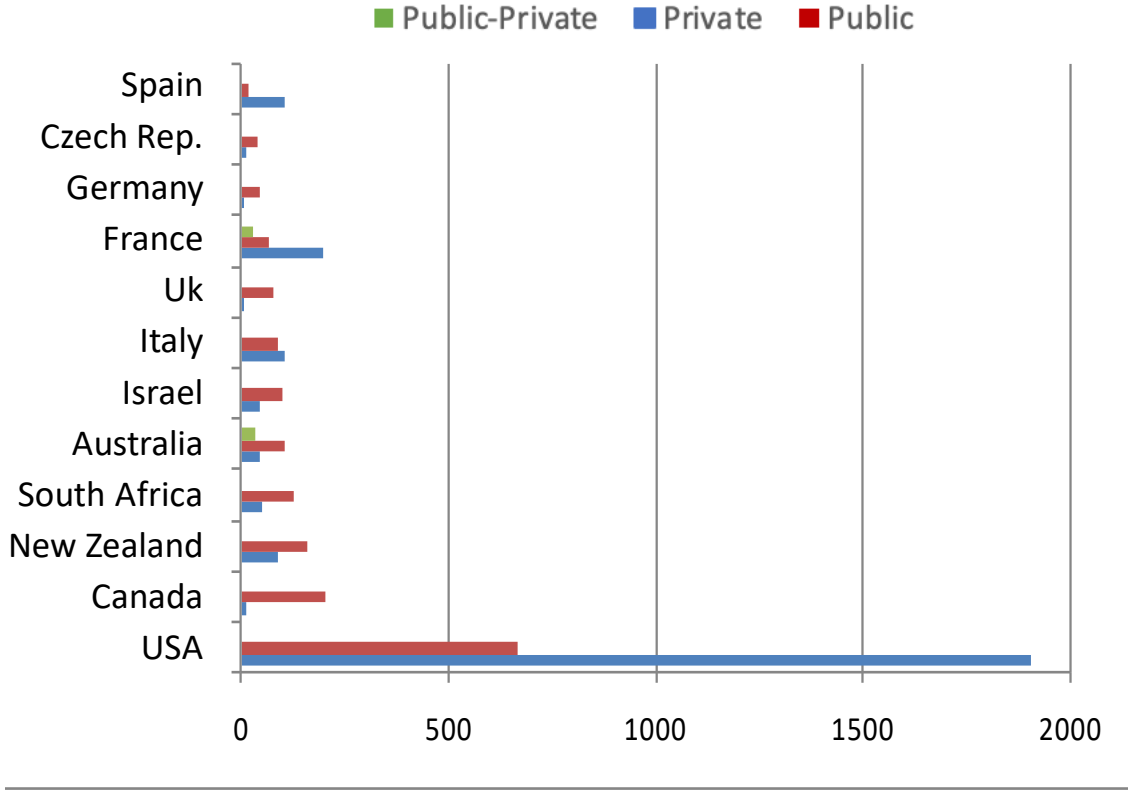
What kind of institutions are the fruit cultivars coming from?



10´s Decade still on review

*Private study over world PBR´s and Plant Patents 1970-2010

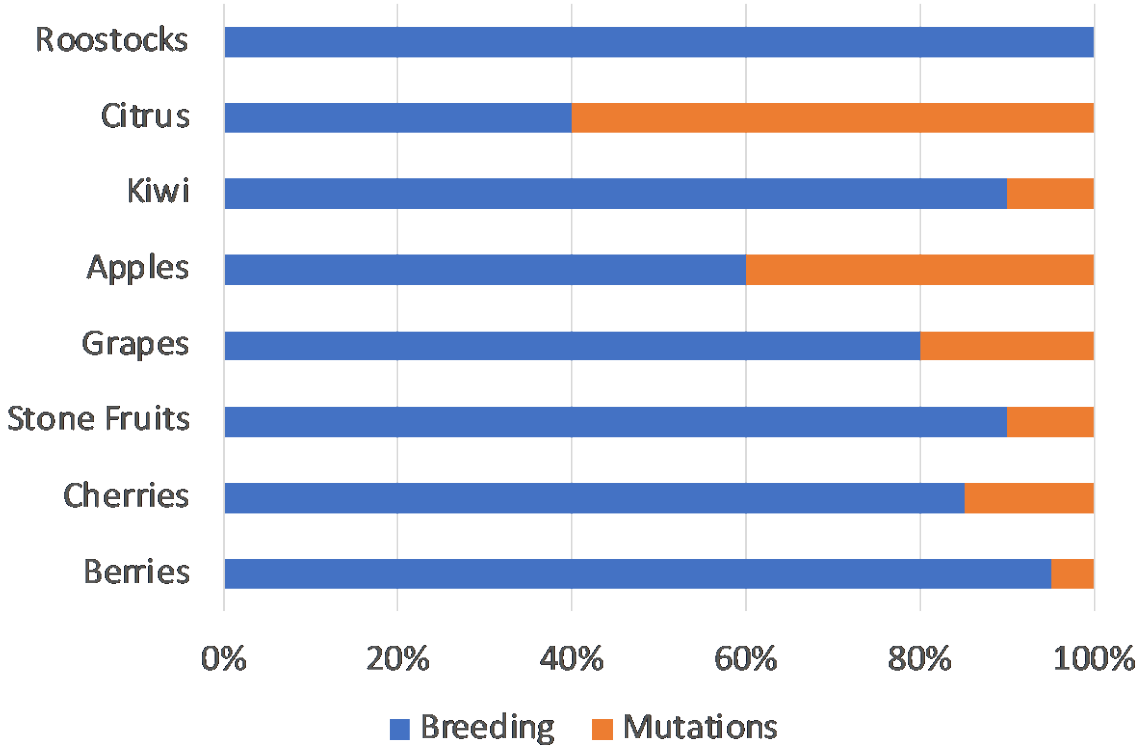
What kind of institutions according to the cultivars applications per country?



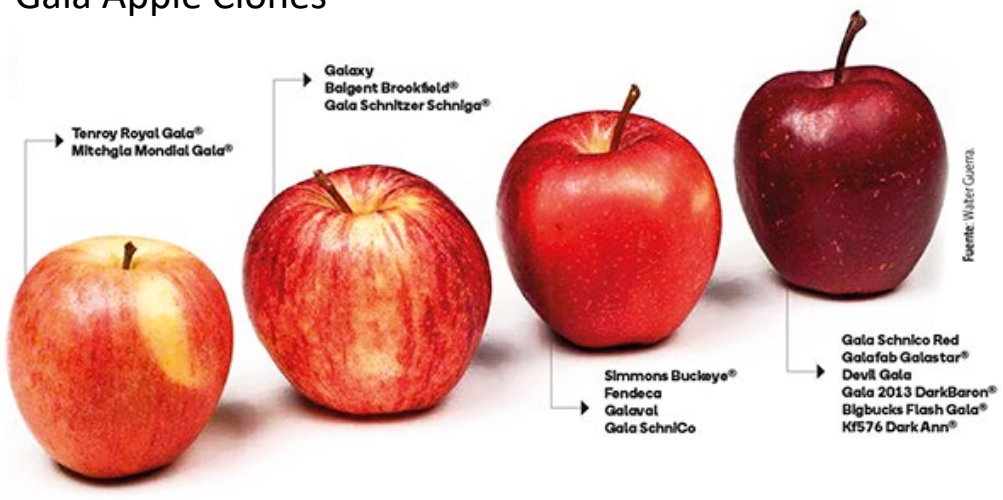
Number of Cultivars Protected or Patented

US, France, Spain and Italy were countries with dominante private breedings applications

Are they coming from cross-breeds or mutations?

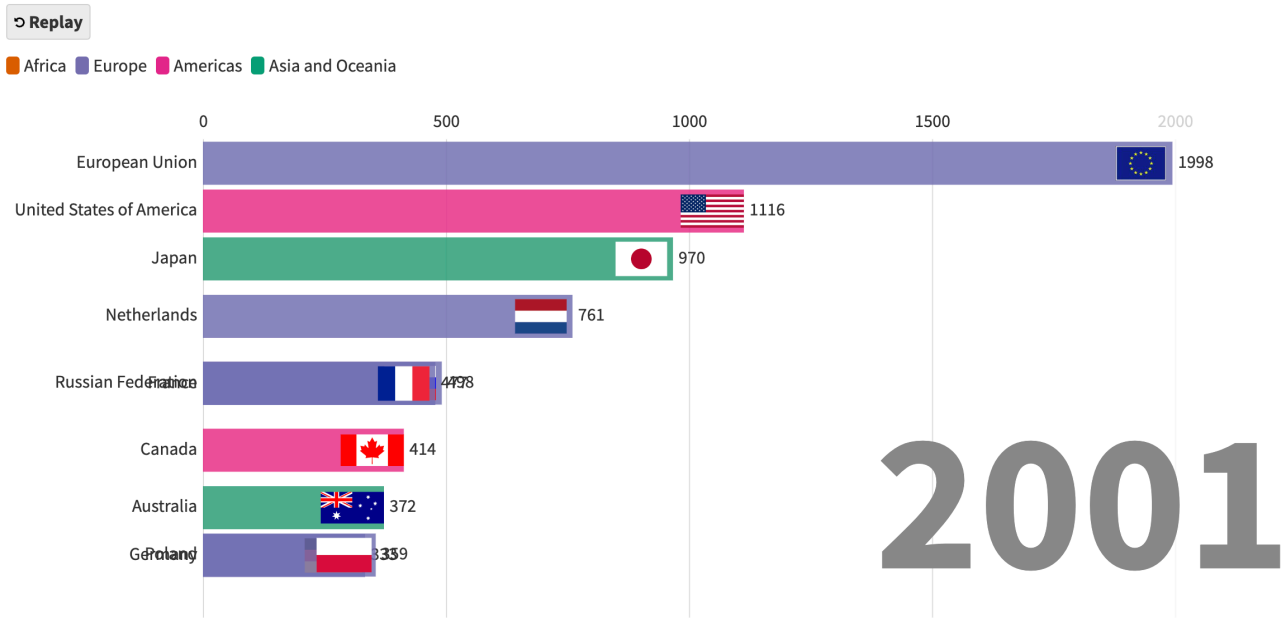


Gala Apple Clones



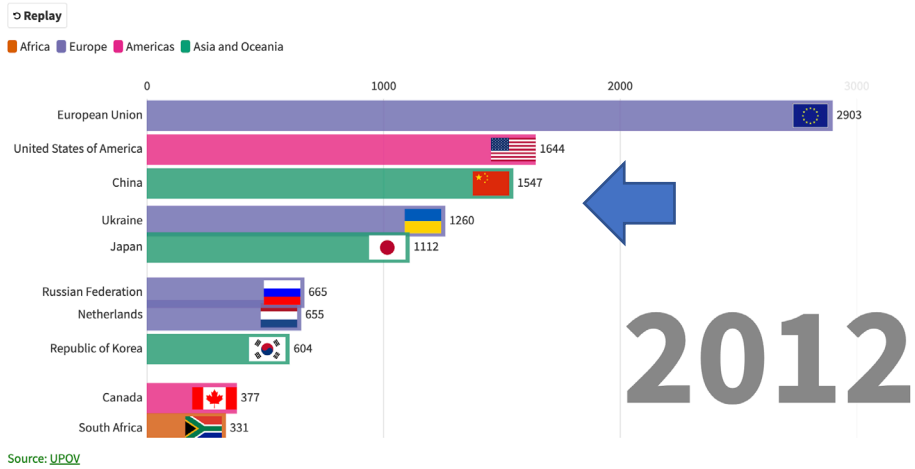
New cultivars (all species) applied in the world

Graphic 1: Top 10 UPOV members by number of PBR applications received (1999–2020)



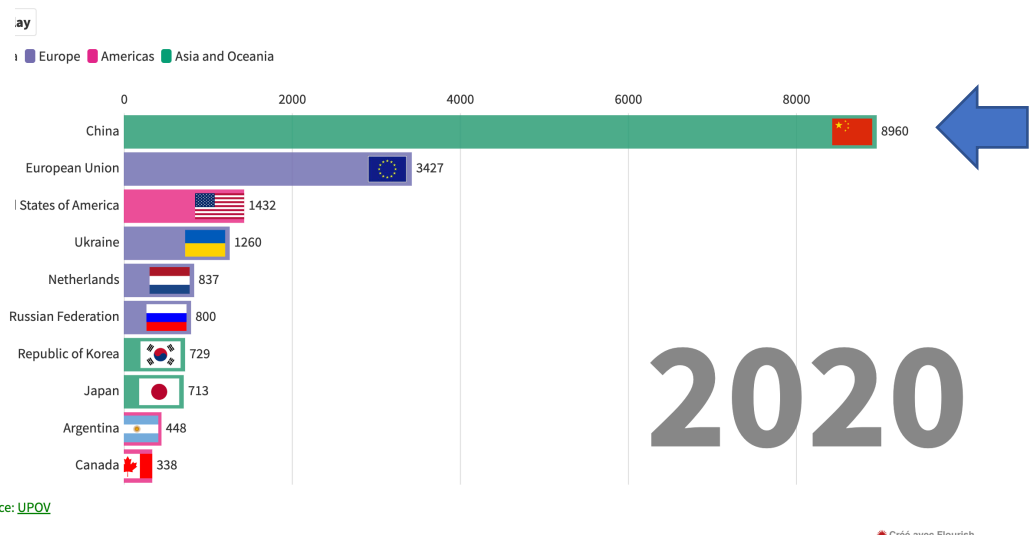
Source: UPOV

Graphic 1: Top 10 UPOV members by number of PBR applications received (1999–2020)



Source: UPOV

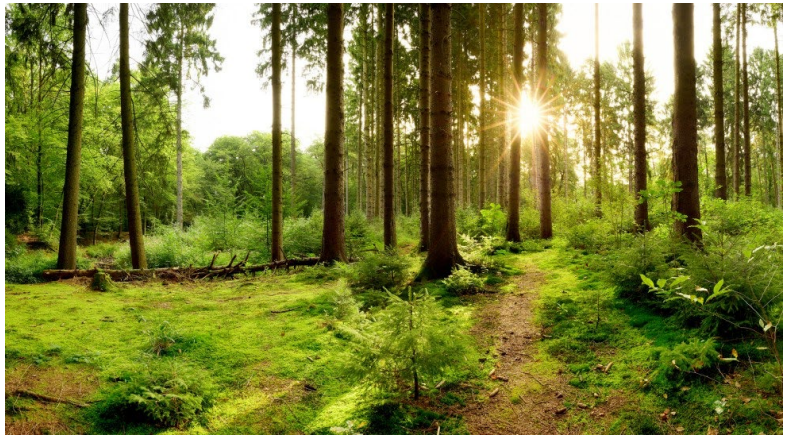
hic 1: Top 10 UPOV members by number of PBR applications received (1999–2020)



Source: UPOV

Who cares about new cultivars?

Growers



Environment

Consumers

Society

Who cares about new cultivars?

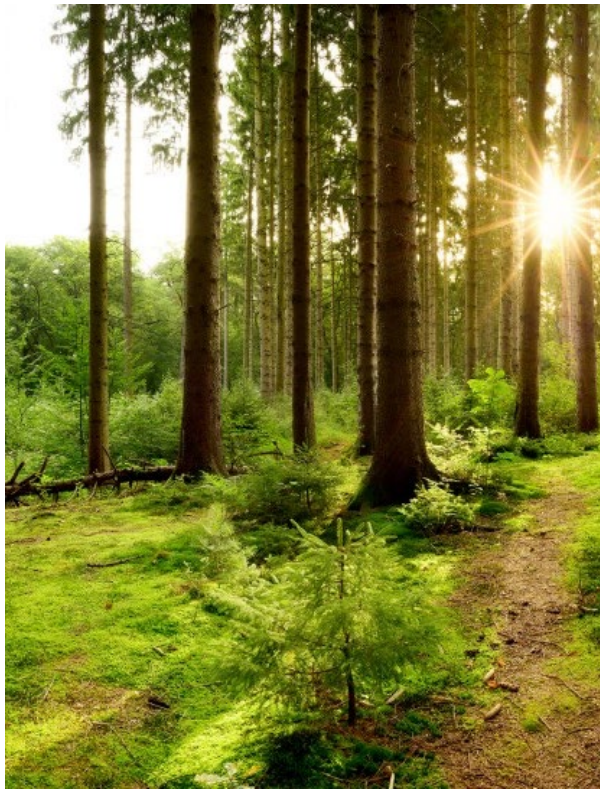
Growers

Environment

Consumers

Society

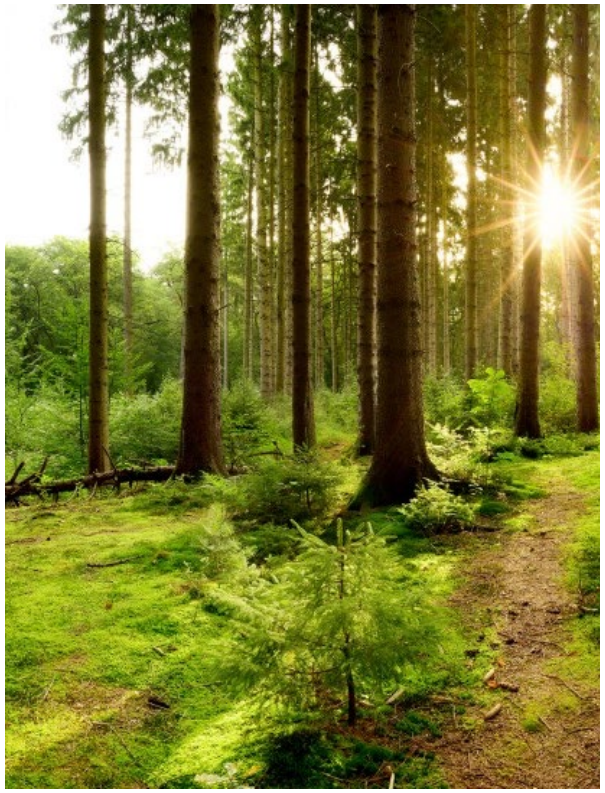





Can we meet those demands from the genetic side?

Not entirely, but we can meet a good proportion of them…





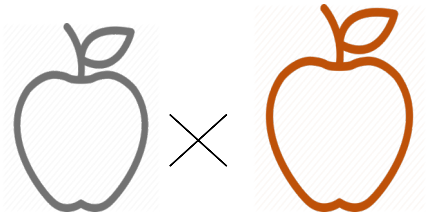

Can we think only about consumers but not growers?

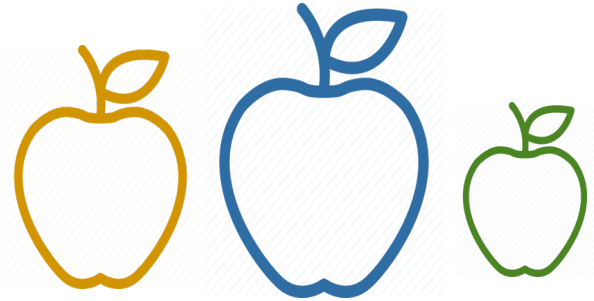
Can we think only about the environment but not consumers?

What tools do we have?

1 Conventional Techniques

a) Cross-Breeding





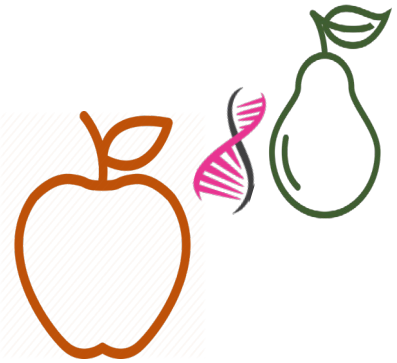
Diversity

b) Mutagenesis

Random
Few Traits

2 Genetic Modification

a) Transgenic

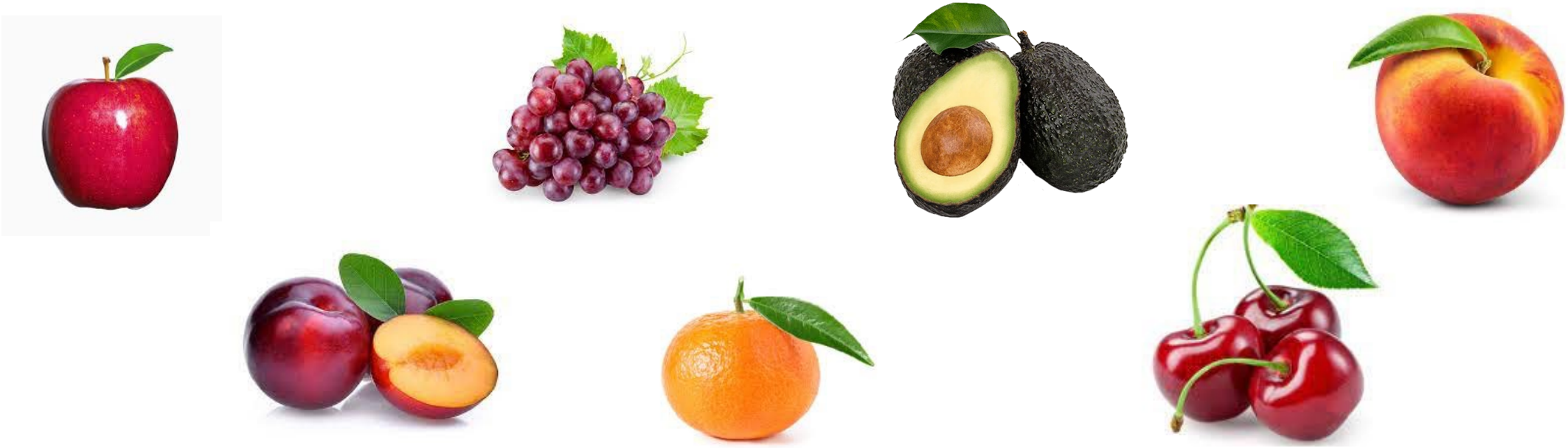


GMO

b) Gen Editing

Precision
Non GMO

Do we want something really different or better?

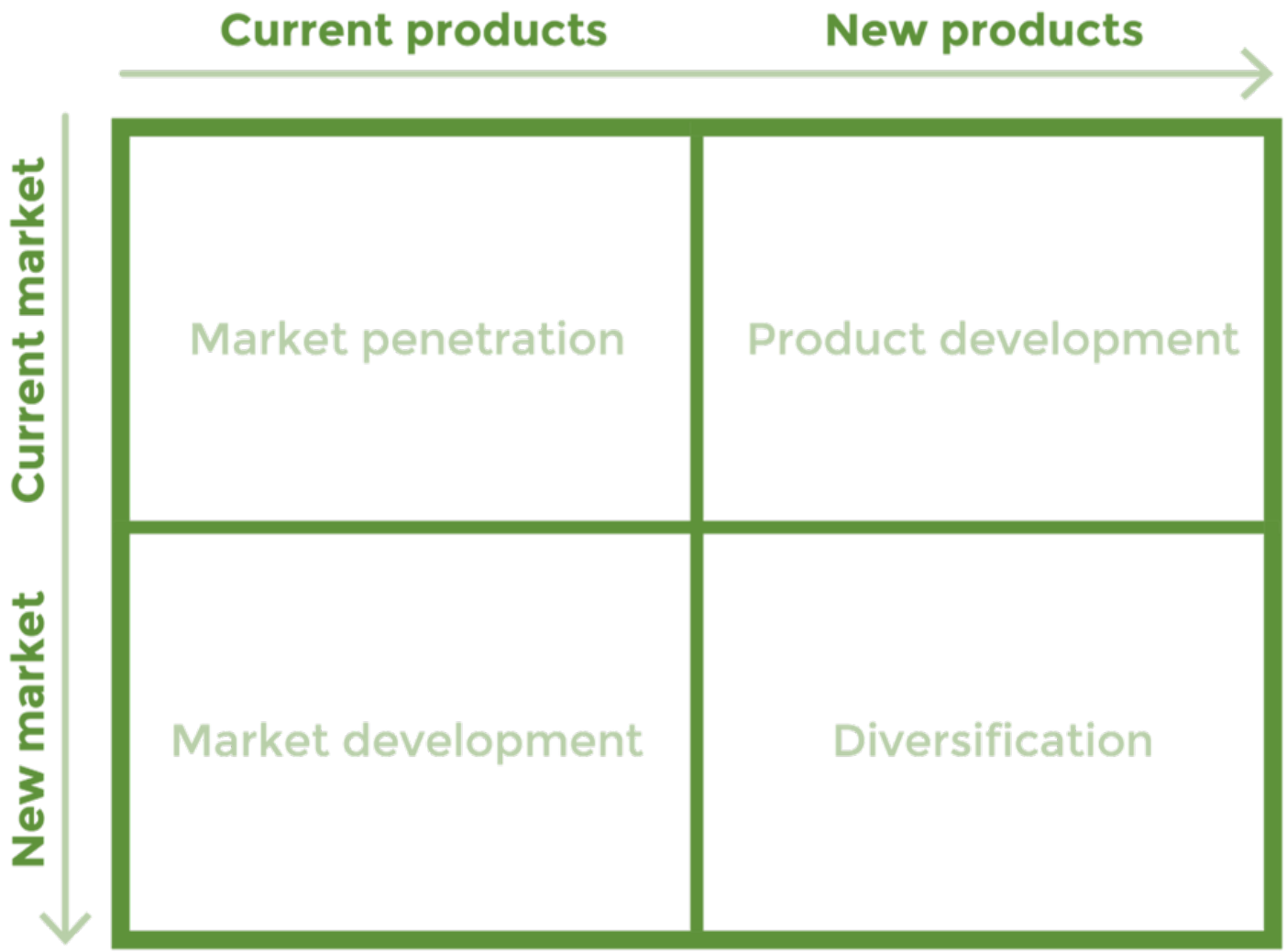


GENETIC BACKGROUND

What if we wanted something like this?

PINK LADY ®

HONEY CRISP


Current products
New products
Current market
New market
Market penetration
Product development
Market development
Diversification

	Current products	New products
Current market		
New market		

Can we do this easily?

European Commission

JRC SCIENCE FOR POLICY REPORT

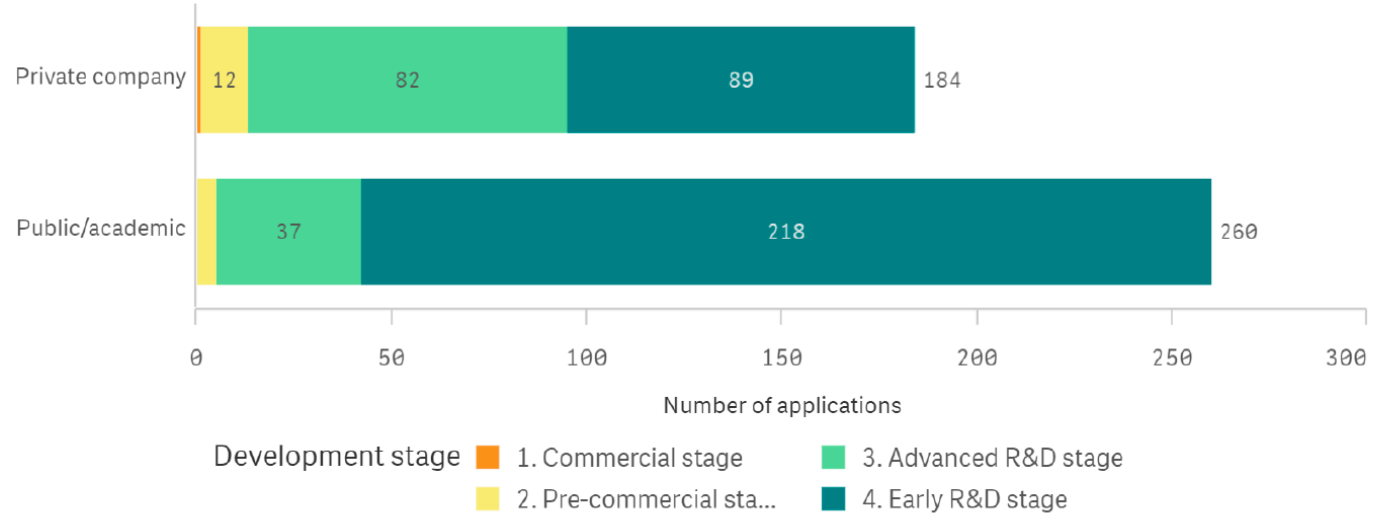
Current and future market applications of new genomic techniques

C. PARISI
E. RODRÍGUEZ-CEREZO

2021

EUR 30589 EN

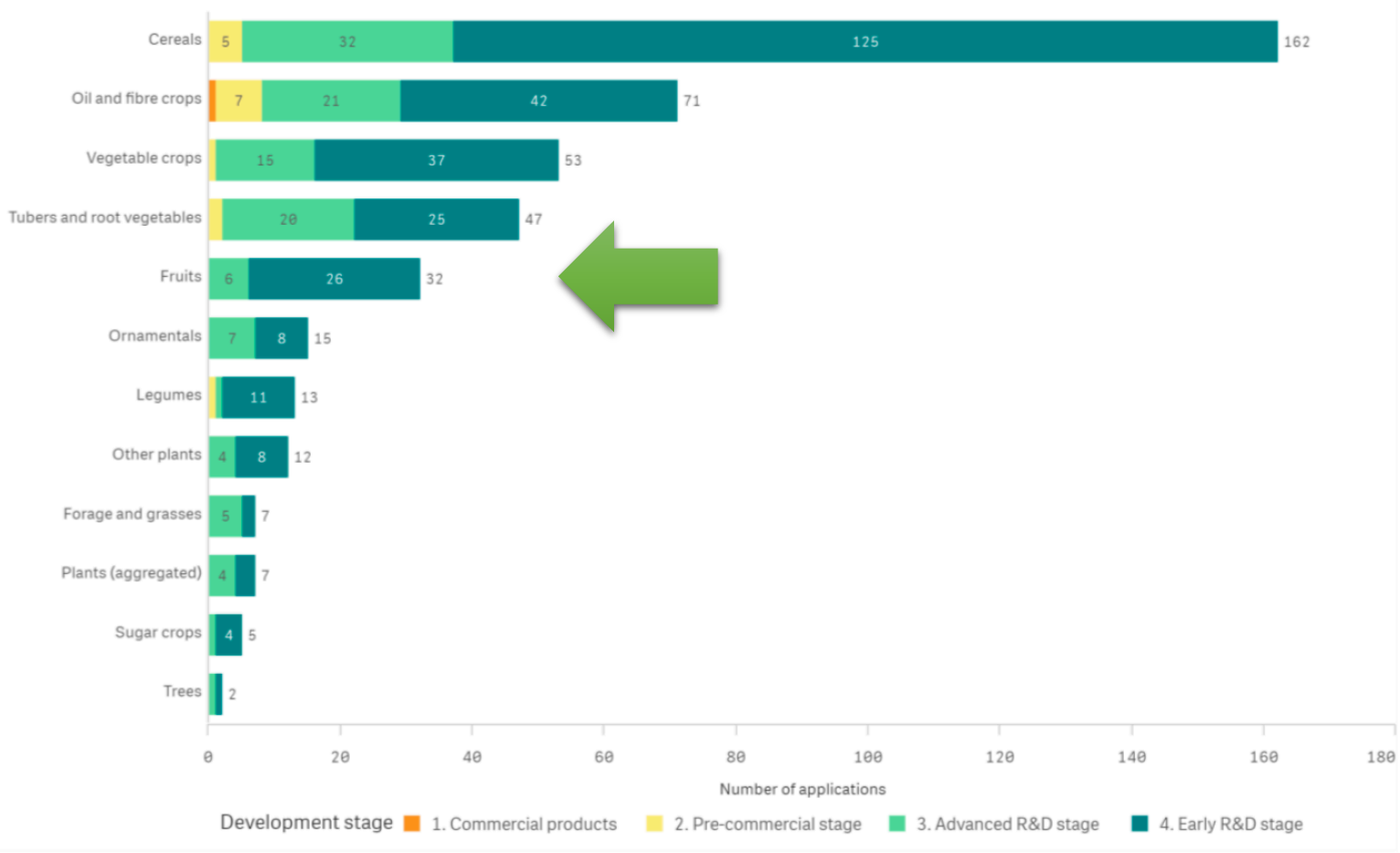
Figure 5. Distribution of NGT-produced plants by type of developer (private or public/academic) and development stage



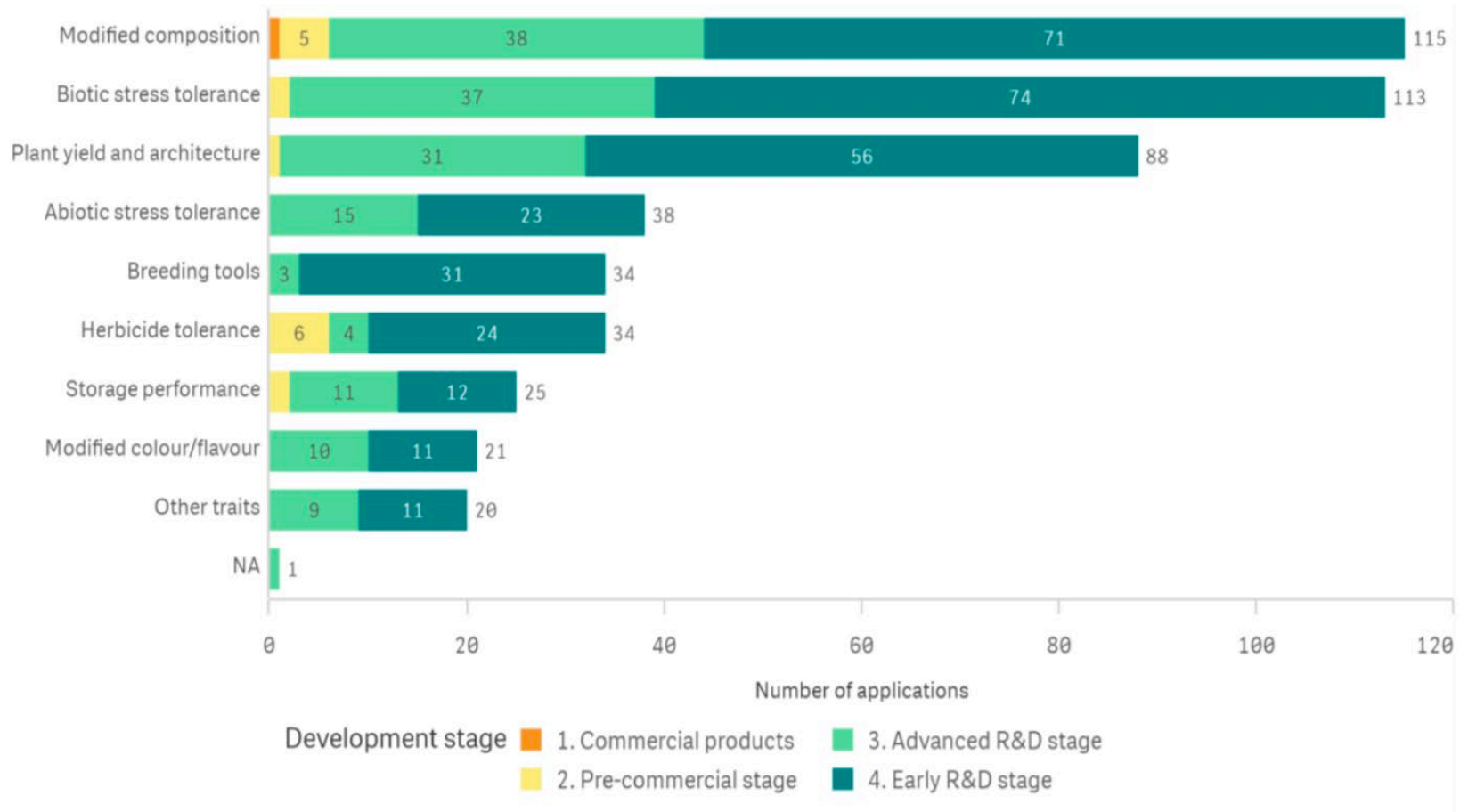
Source: Authors' research.

Figure 6 shows the distribution of the 426 NGT-produced plants identified in our database by commercial development stage. NGTs are used mostly in cereals (162 products), followed by oil and fibre crops (71), vegetable crops (53), and tubers and root vegetables (47).

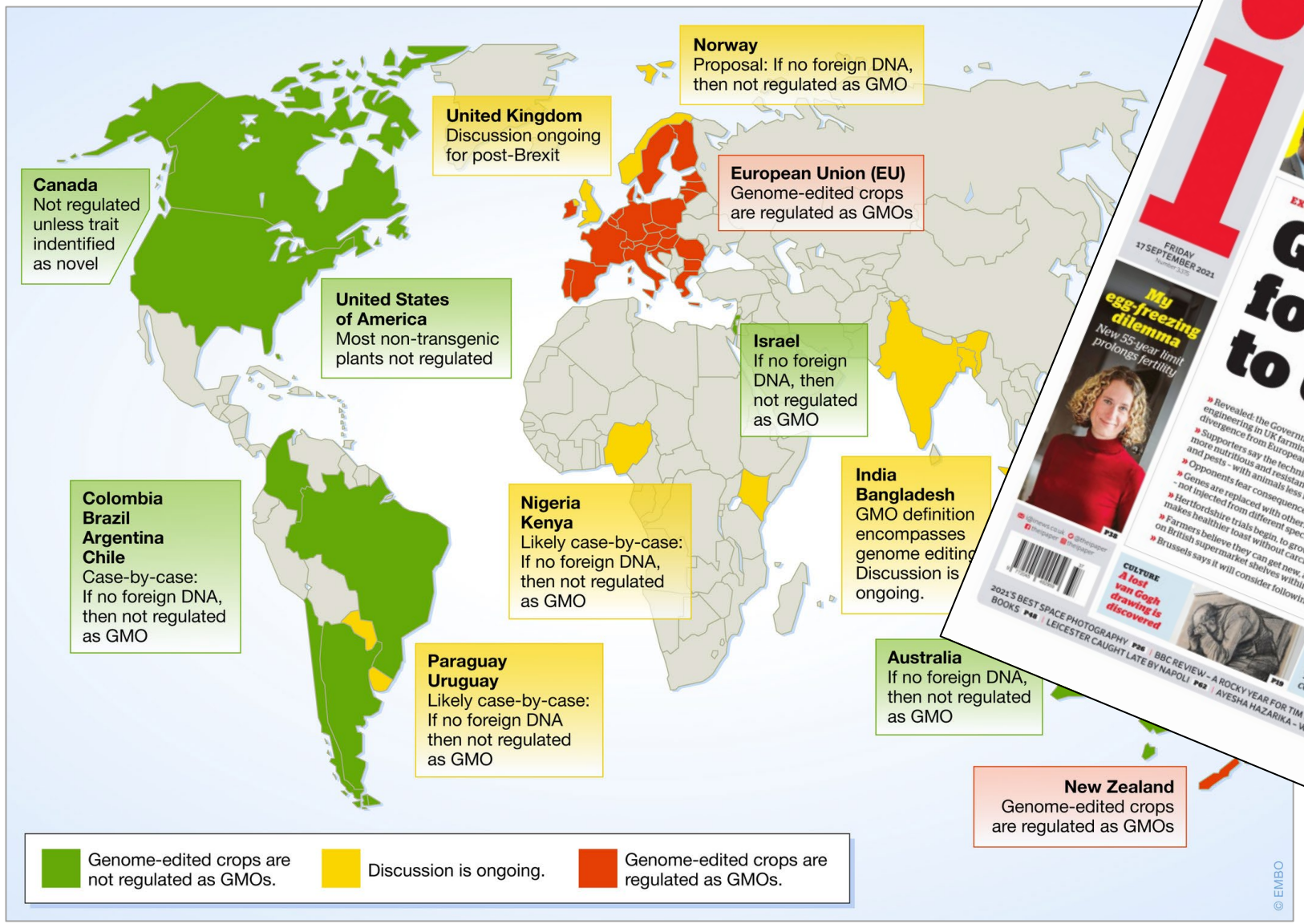
Figure 6. NGT-produced plants identified in the four development stages (commercial, pre-commercial, advanced R & D and early R & D), by plant group



7a. Trait category and development stage

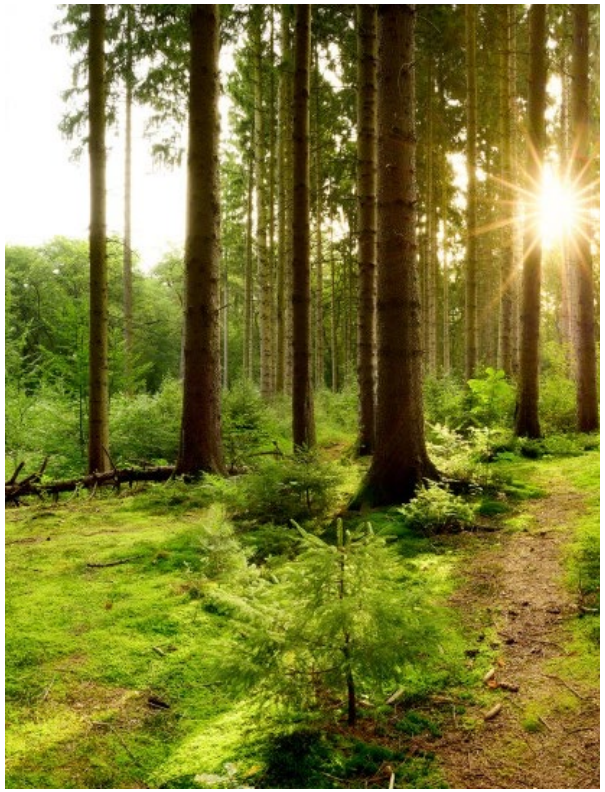


World Gene Edited Plant Regulation Status



Ok, let’s go back to our target-audiences…






This is a simulated scenario

What is the value related to genetics?

Example:

Mandarines Scenario
VNA US$/hectare

Ton/ha	36.000
Export %	65
US/kilo	0,9
Incomes	23.580
Costs	8.500
VNA	56.696

Yield Increase

Ton/ha	36.000	45.000	50.000
VNA	56.696	77.154	89.429
Benefit	0	20.458	32.733

- Productivity
- Higher densities

Price Increase

US$/kilo	0,9	1,1	1,3	1,5
VNA	56.696	72.924	89.152	105.380
Benefit	0	16.228	32.456	48.684

- Quality
- Size

Pack Out Increase

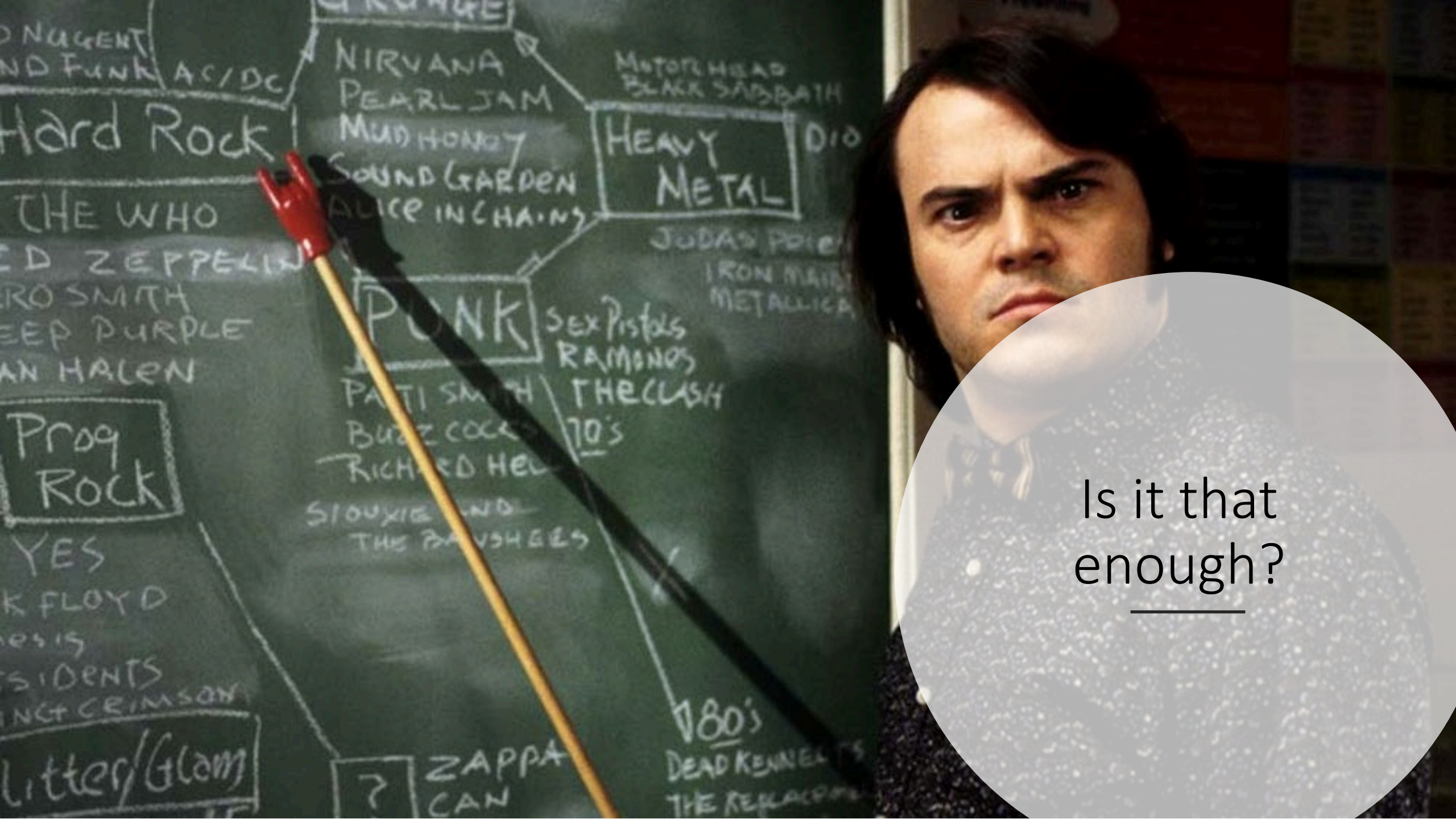
Export %	65%	75%	85%
VNA	56.696	65.237	73.779
Benefit	0	8.541	17.083

- Less creasing
- Color

Combined Benefits

Benefit	0	45.227	82.272	98.500

- *20% of those benefits will be 19.000 US/ha?*
- *Do I pay at plantation (royalty per tree), or according to my performance (royalty per production)?*



Is it that enough?

Again, if we do not have more than new cultivars none of these will be good enough

Companies are working to add value both: genetically and commercially

BIOGOLD
CITROGOLD

SUN WORLD

IFG
Bringing something special to the table

…these are some of them

A new cultivar: what I am getting into?

Tech Imput

Branded Product

Business

ROYALTIES

Not so easy, right?

What picture you want to be in?

So what is BIOFRUTALES?

INIA
Universidad Andrés Bello
Universidad Federico Sta. María
Universidad de Talca
U. de Chile
Fundación Chile
Agrícola Brown
Univiveros
Vivero El Tambo
Vivero Los Olmos
Viveros Requínoa
ANA Chile
Fedefruta

BIOFRUTALES
CONSORTIUM

A public-private effort to improve genetic fruit programs

TABLE GRAPE BREEDING PROGRAM

RESEARCH

BREEDING

SELECTION

TECH PACK

NEW CULTIVARS

PRODUCTION

BREEDING PROJECT

Dr. Paola Barba
INIA

TECH PACK PROJECT

Dr. Cecilia Peppi
INIA

COMMERCIAL & TRANSFER PROJECT

Luis Fernández
ANA CHILE

Grupo LOS OLMOS

VIVEROS EL TAMBO

BROWN GROUP

univiveros

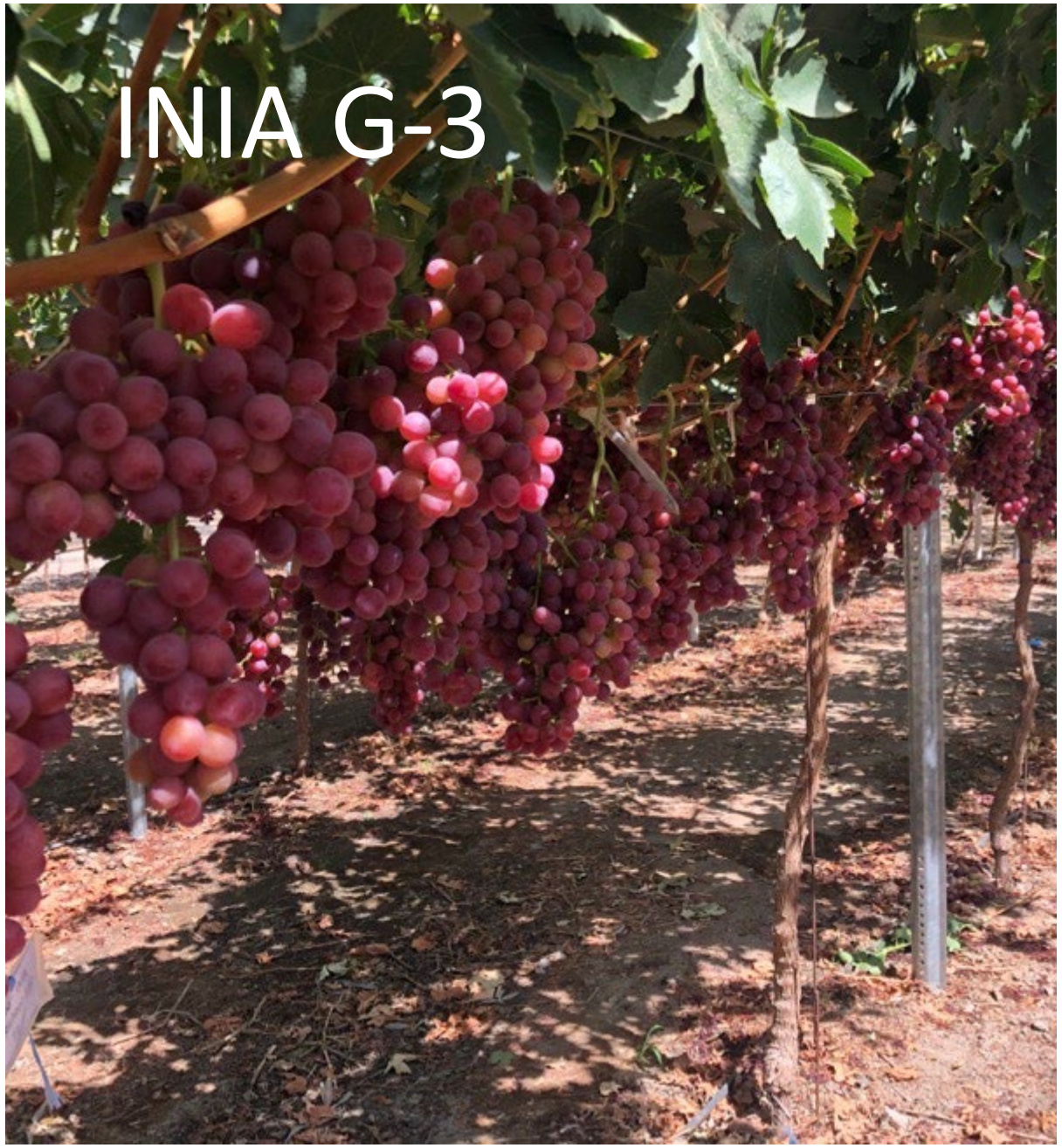
FedeFruta
FEDERACION DE PRODUCTORES DE FRUTAS DE CHILE

CORFO

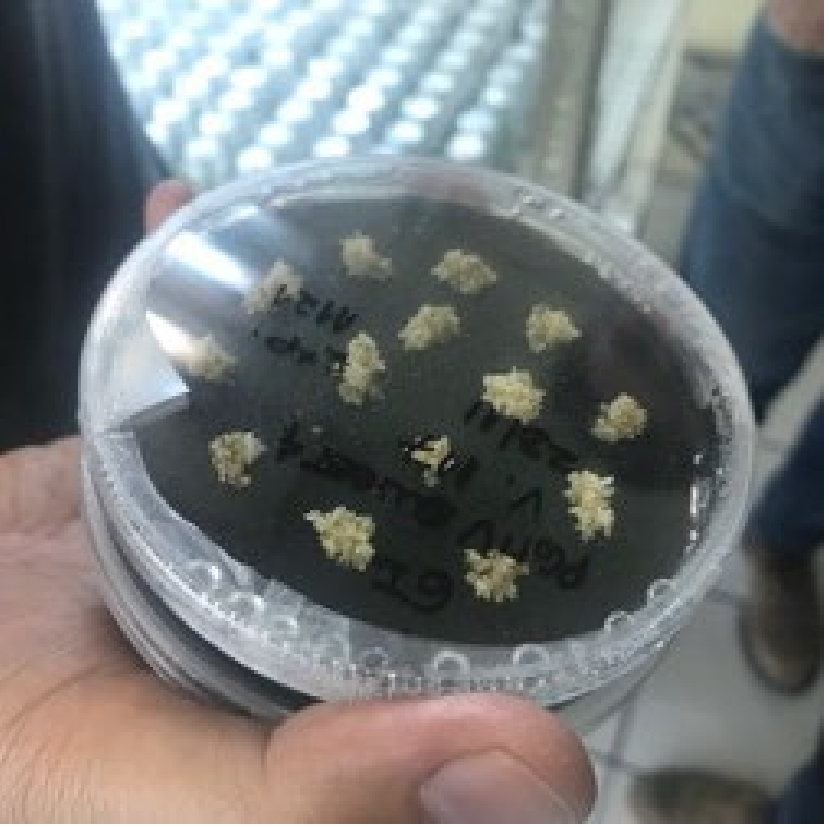
MAYLEN®

Ministerio de Agricultura
Gobierno de Chile
INIA

INIA G-3

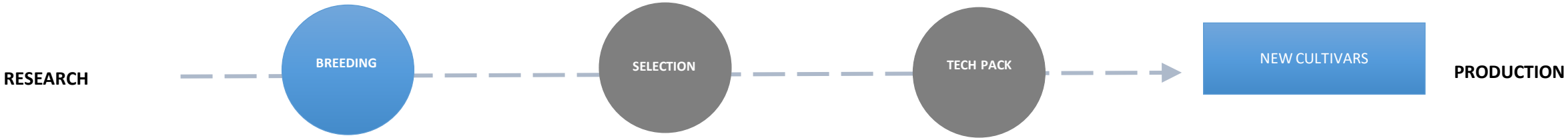


INIA G-4



- FUNGUS RESISTANT GRAPES BY GENE EDITING

PEACH AND NECTARINE BREEDING PROGRAM



BREEDING PROJECT

Dr. Rodrigo Infante
UCHILE

UNIVERSIDAD DE CHILE

COMMERCIAL & TRANSFER PROJECT

Luis Fernández
ANA CHILE

A.N.A.
Your International Best Partner

VICONTO

MAGNA Fruit

GEOFRUT

GARCES FRUIT

FedeFruta
FEDERACION DE PRODUCTORES DE FRUTAS DE CHILE

25% of National Plant Sales

UNIVERSIDAD DE CHILE

MOLECULAR MARKERS- MAS

- Seedlessness

- Peach/Nectarine
- Acid /Subacid
- Rounded /flat
- Melting /Non Melting
- Slow Ripening
- Picking Time
- **MEALINESS**

- Picking Time
- Firmness
- Size

Mealiness Molecular Market

UNIVERSIDAD ANDRES BELLO

SWEET CHERRY BREEDING PROGRAM

RESEARCH

BREEDING

SELECTION

TECH PACK

NEW CULTIVARS

PRODUCTION

CLIMATE CHANGE

BREEDING PROJECT

Gamalier Lemus
INIA

TECH PACK PROJECT

Dr. José Donoso
INIA

Grupo LOS OLMOS

VIVEROS EL TAMBO

A.N.A.

univiveros

Fedefruta
FEDERACION DE PRODUCTORES DE FRUTAS DE CHILE


Ministerio de Agricultura
Gobierno de Chile
INIA

APPLE BREEDING PROGRAM

RESEARCH

BREEDING

SELECTION

TECH PACK

NEW CULTIVARS

PRODUCTION

BREEDING PROJECT

José Antonio Yuri
U TALCA

TALCA UNIVERSIDAD CHILE

ANDES NEW VARIETIES ADMINISTRATION A.N.A. Your International Best Partner

ifo

TALCA
UNIVERSIDAD
CHILE

Gene Edited Apples: Carotenoids over-expression and slow browning

BLUEBERRY BREEDING PROGRAM

RESEARCH

BREEDING

SELECTION

TECH PACK

NEW CULTIVARS

PRODUCTION

BREEDING PROJECT

Carlos Muñoz
UCHILE

UNIVERSIDAD DE CHILE

CLIMATE CHANGE

Camposol

FedeFruta
FEDERACION DE PRODUCTORES DE FRUTAS DE CHILE

UNIVERSIDAD DE CHILE

Biofrutales Consortium is an innovation platform, connecting research institutions and companies worldwide


I choose this one!