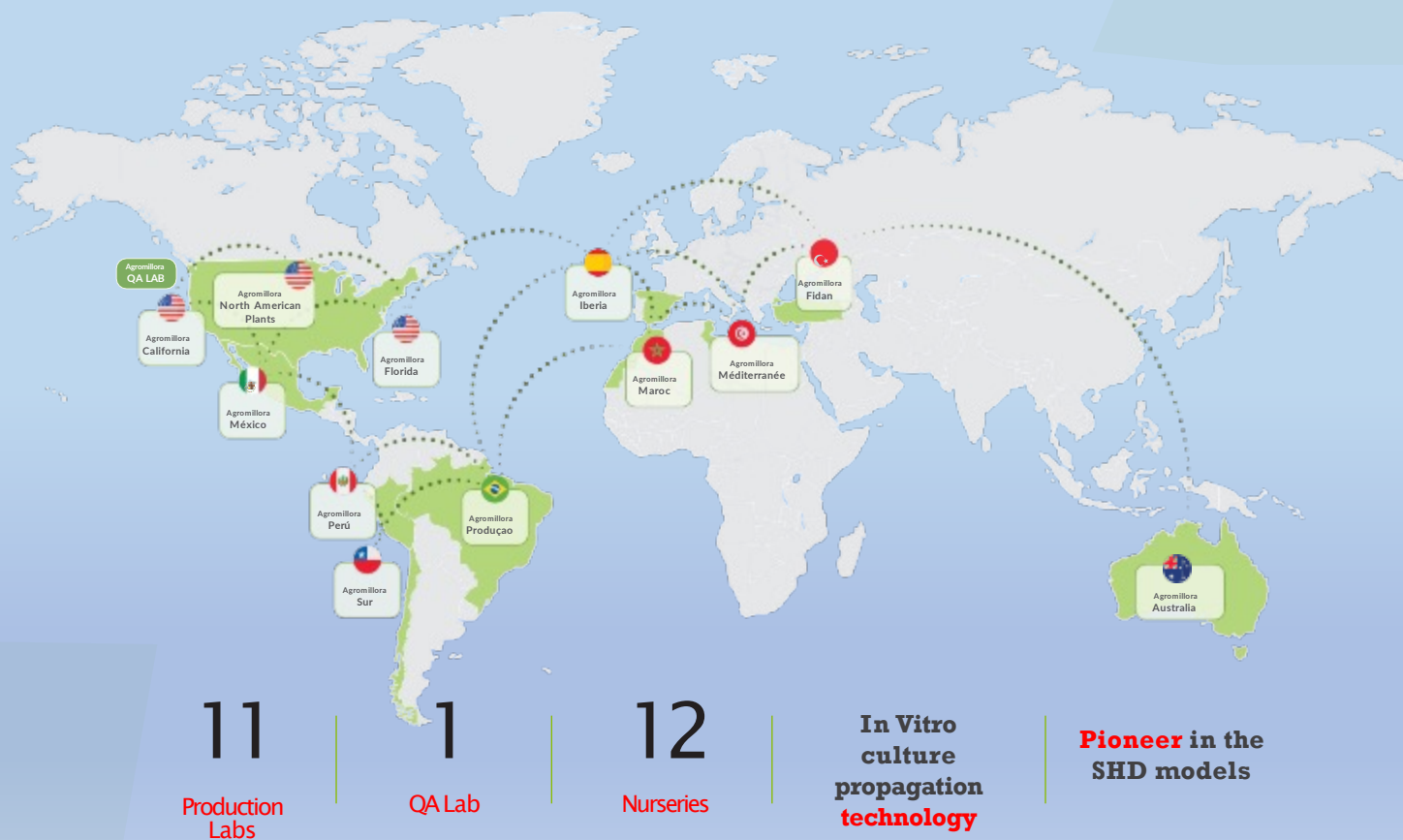


New Development of Micropropagation on Raspberry

Yongjian Chang, Ph.D.



We are a multinational nursery with in vitro labs specialized in propagation of fruit trees, nut trees and berries species



We introduce, propagate and protect genetics

As a global leader, Agromillora plays a crucial role in propagation for the world's largest genetic holders



Value proposition
for **genetics holders**
and your growers



Join the Agromillora Genetics Platform

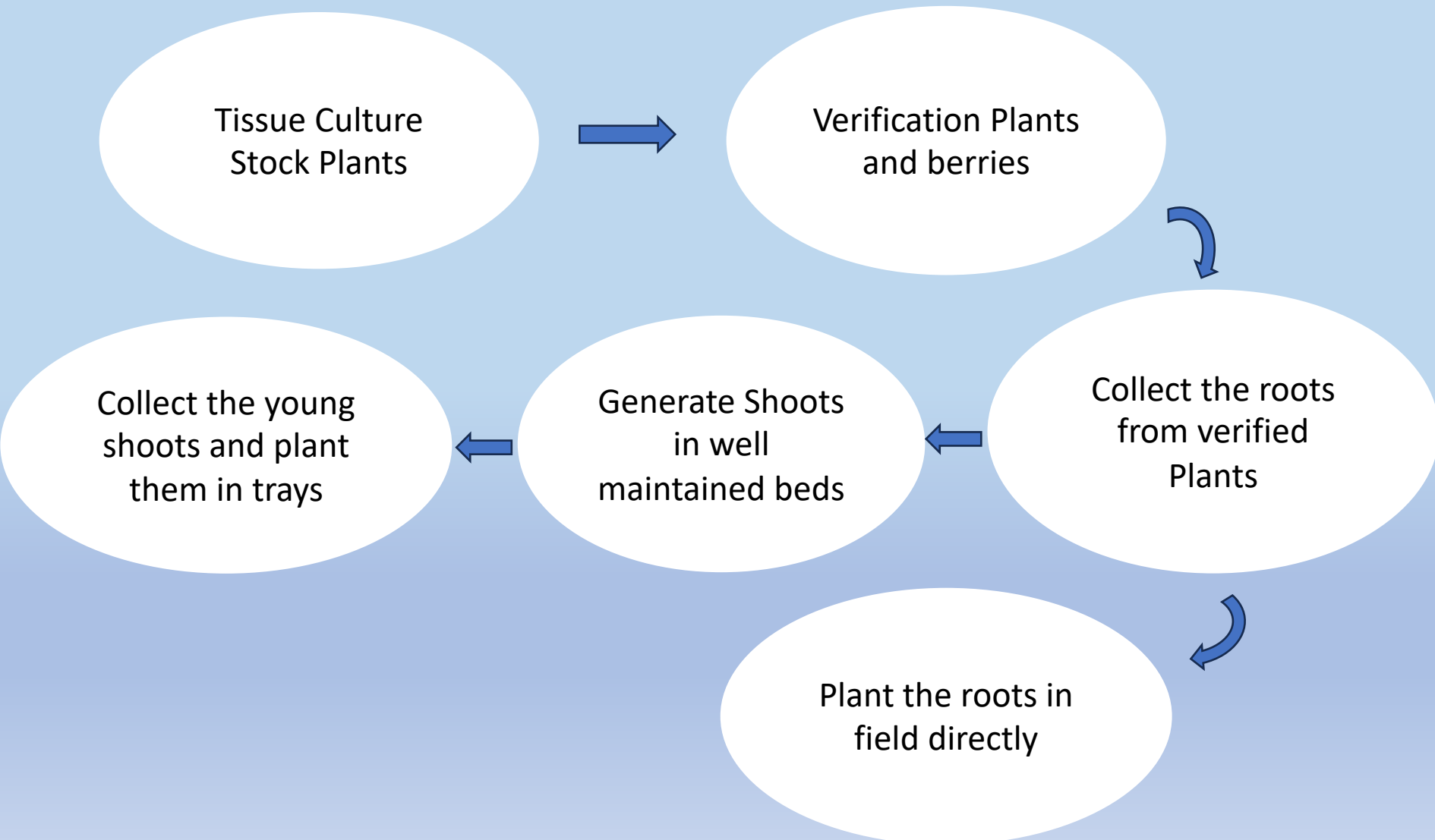
THEY TRUST US



UNIVERSIDAD DE CORDOBA



Conventional Raspberry Plant Propagation



Why directly using tissue culture Plants?

- Clean Plants (Virus Certified)
- Quick to meet the demand, especially for new released varieties
- Any season
- Excellent root system
- High Uniformity
- More Predictable



Reinfections on Three Raspberry Viruses

Field Age	Crumbliness 0: normal 3: severe	Virus incidence %		
		RBDV	RLMV	RpLV
	0 1 2 3			
2	1	44	25	0
3	2	100	100	0
4	3	93	100	7
5	3	100	100	40
6	3	92	96	40

Rejuvenation

More Uniform



More Vigorous



Plants in Production much Longer

- The plant from tissue culture would produce 4-5 years instead of about 2 years from root cuttings



26 Tons/Hectare at the year 6
(Pacific Centennial Raspberry,
Queretaro, Mexico)

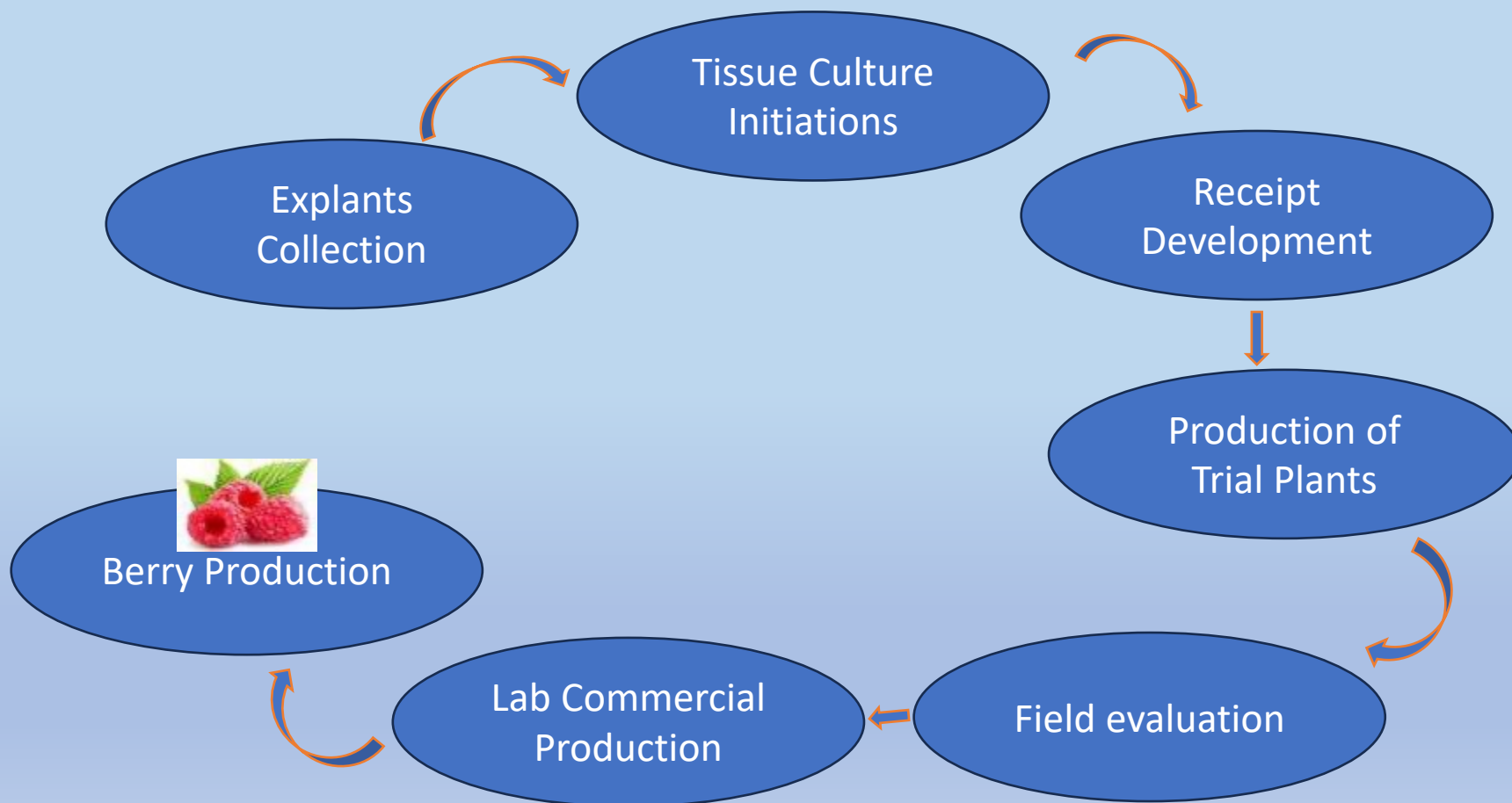
Planting Schedules

- Flexible on Planting
 - 3-5 months before planting vs >1.5 years
 - Whole year around planting vs Limited season availability

Mutation Concerns?

- Shoots from lateral buds in tissue culture
- Multiply many times
- Variety dependent
- Adventitious shoots from root cuttings
- Individual plant

Micropropagation of Raspberry Plants



Trial Plants

- Random selection from the cultures
- Large enough sample (about 10K plants)
- Mother in vitro plant material management

Field Evaluations

- Ideal climate and cultivation conditions
- Any off type of leaves and stems
 - color, shape, size...



Field Evaluation

- Malformed berries
 - Off type or cultivating factors?



Controls for tissue cultures

- Subculture number (10 or more?)
- Cytokinin level control
- Multiplication Rate (2.5-3.0)
- Shoots from lateral buds
- No shoots from callus



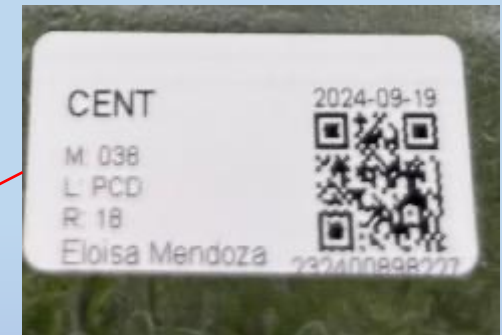
Traceability in the Lab

- Mother Stocks
 - Low subculture Numbers (Multiple years)
 - Most time in cooler (2-6 C with 16-hr lights)
 - Multiple years
- Holding Stocks
 - Larger volume and make it ready for production
 - One year
- Production Stocks
 - One season or less



Traceability: SIGI System

- Record of all activities from explants to planting



About 100 million tissue culture raspberry plants produced in Agromillora Group following our protocol with about 0.5% off type in the field



Argomillora Maroc

Benslimane



Production of high-quality fruit plants



Modern in vitro plant laboratory



Expertise in micropropagation techniques



IT traceability system



About Our Company in Morocco



Agromillora
it's in our nature

19 yrs

Founded In 2006

1

Laboratory

11 Ha

100

employees

**Many
Species**

4-6 Millions

Plants delivered /year

Raspberry Propagation in Agromillora Morocco

- Increased demand in raspberry plants
- Limitations on *Xylella fastidiosa* quarantine
- About 10 years of tissue culture raspberry experience



Thank You!!

