PRESENTATION

HEMPitadm

innovation & création variétale

BUSINESS UNIT DEDICATED TO INNOVATIVE INDUSTRIAL HEMP VARIETIES

CONTEXT & BREEDING BACKGROUND

- **One main market :**
  - Paper industry
- **Breeding was mainly in France**
- **Historical breeding traits:**
  - Monoecious trait
  - THC levels
  - Earliness
  - Yield (Biomass)
  - High fiber content

➢ **Creation of mixed oriented varieties**

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NEW OPPORTUNITIES

- **Emerging markets**
  - Plastics industry : strong development of eco-materials

    Plastic production : 2,11 millions of tones in Europe in 2020

    Bioplastics rate: 1% – strongly increasing market (1)

  - Textile : cottonized fiber, long fiber

    26 millions of tones of cotton produced worldwide every year (2)

    Against 30 000 tones of hemp fiber for textile

    Market waiting for more eco-friendly fiber

  - Alimentation : oil, protein

  - Secondary metabolites / Cannabinoids

➢ **Need of varieties segmentation**

Sources : (1) www.european-bioplastics.org ; (2) OCDE/FAO, 2019. Coton, in: Perspectives Agricoles de l'OCDE et de La FAO 2019-2028. Paris. ;

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NEW OPPORTUNITIES

- **Specific needs according to markets:**
  - Plastics industry : intrinsic and technical characteristics of fibers, reproducibility, decortication capacity, fiber yield
  - Textile : fiber fineness, long fiber yield (weaving) , decortication capacity
  - Alimentation : oils and proteins composition in seeds, seed yield, oil yield, seed size
  - Secondary metabolites : content and composition of CBD and other cannabinoids

- **Global needs :**
  - Earliness
  - Yield / useful material rate
  - THC content

➢ **Need of specifics varieties**

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BUSINESS UNIT TO ANSWER EMERGING MARKET

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New business unit dedicated to creation of

INNOVATIVE VARIETIES per MARKET

- Specific breeding schemes per market
- Integration of new technologies in the breeding process
- Development of phenotyping and measurement tools to assess breeding traits of interest according to markets

➢ **Segmentation per market of our varieties**

ONE TEAM FOR :

VARIETAL RESEARCH AND DEVELOPMENT

- Purpose:

Development of (bio)technological methods and tools to speed up and sharpen the breeding programs

- Means:

A R&D laboratory oriented on 3 major technologies:

- ***In vitro culture :*** *conservation and multiplication of improved plants, study of pollen (in)compatibility in crossings…*
- **Molecular labeling:** *marker assisted selection, parentage control…*
- **Phenotyping :** *yield and fiber components measurements, trait measurements by picture digital analysis…*

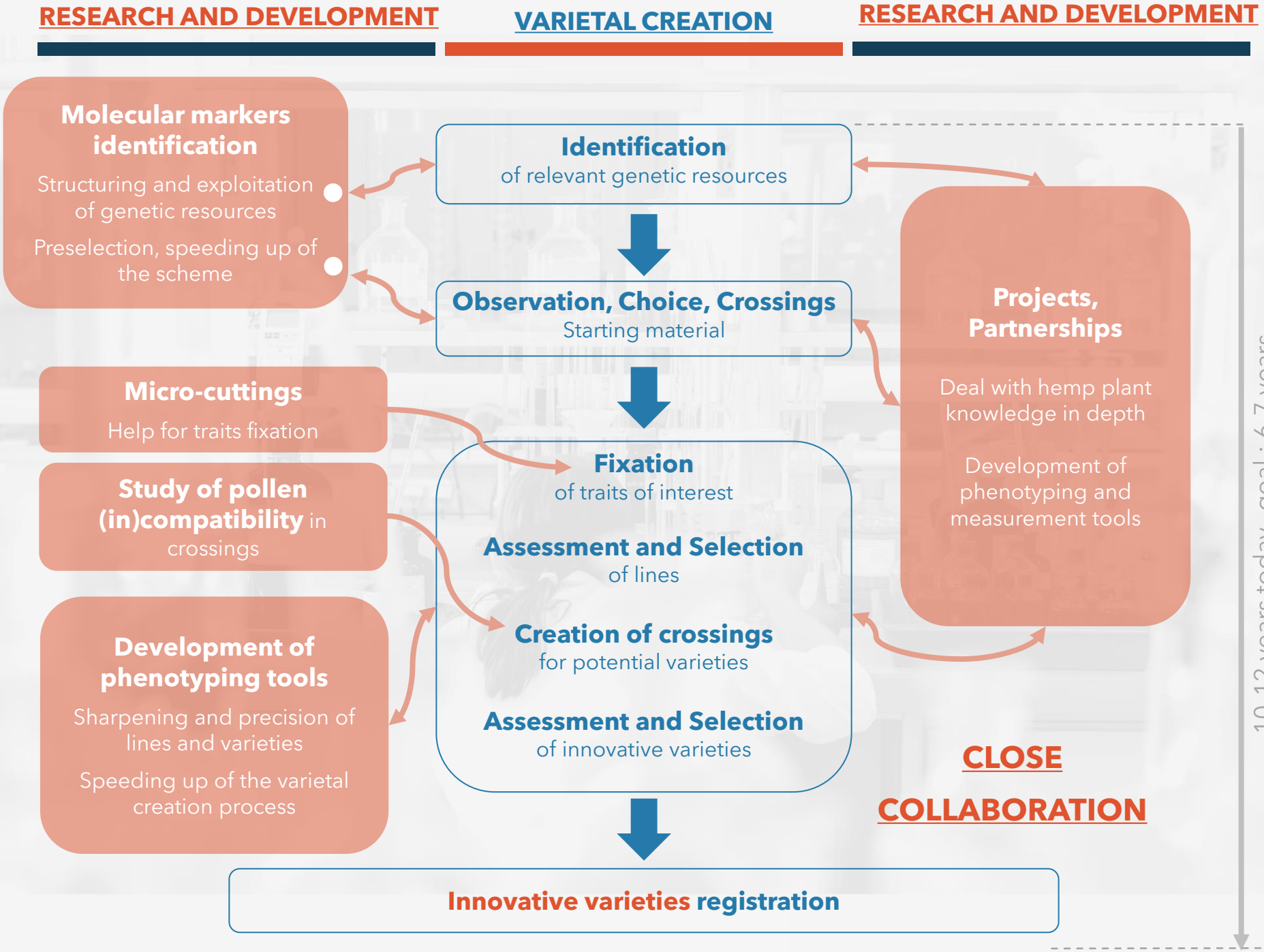
ONE TEAM FOR :

VARIETAL CREATION AND INNOVATION

- Purpose:

  Development of breeding programs per market for the creation and registration of new varieties

- Means:
  - **Growth chambers and greenhouses :** *directed crossings of plants, shortening of varietal developing time*
  - **Micro-plots for selection and experimentations:** *phenotyping of lines, development of crossings tables to create new potential varieties*
  - **Plots for varietal trials in the production areas :** *assessment of the innovative characters, the flexibility and the stability of potential varieties according to markets*
  - **Varietal registration :** *production of certified breeder and foundation seeds, transfer for seed multiplication and commercialization to* HEMPit


RESEARCH AND DEVELOPMENT
VARIETAL CREATION
RESEARCH AND DEVELOPMENT
Molecular markers identification
Structuring and exploitation of genetic resources
Preselection, speeding up of the scheme
Identification
of relevant genetic resources
Observation, Choice, Crossings
Starting material
Micro-cuttings
Help for traits fixation
Study of pollen (in)compatibility in crossings
Development of phenotyping tools
Sharpening and precision of lines and varieties
Speeding up of the varietal creation process
Fixation
of traits of interest
Assessment and Selection
of lines
Creation of crossings
for potential varieties
Assessment and Selection
of innovative varieties
Projects, Partnerships
Deal with hemp plant knowledge in depth
Development of phenotyping and measurement tools
CLOSE
COLLABORATION
Innovative varieties registration
10-12 years today- goal : 6-7 years

STRONG INTERACTIONS, NEEDS & CONSTRAINTS

Work in partnerships

Market monitoring and **anticipation**

Mid term **Stability** of the needs (varietal development time)

Interactions with final clients: identification of plant models

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Varietal Research and Development

Varietal creation

Contract work in response to specific needs

Regulation: evolution & stability

Creation of innovative varieties answering to current and future market needs

CONCLUSIONS

- Hemp sector is or will be in competition on global market – its sustainability should include sustainability of the value chain together with seed security and diversity
- Producers need to have access to a range of varieties answering adapted to their needs and the environment changes while answering to final consumers needs
- Breeding together with Research and Development make and will continue making and important contribution to the hemp sector sustainability
- With new challenges, breeders and researchers adapt tools, techniques and breeding programs to respond
- New breeding objectives mean more complexity and sometimes lengthier process to develop new varieties
- Completion of researches, developments and breeding programs requires an enabling regulatory environment

THANKS FOR YOUR ATTENTION

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