




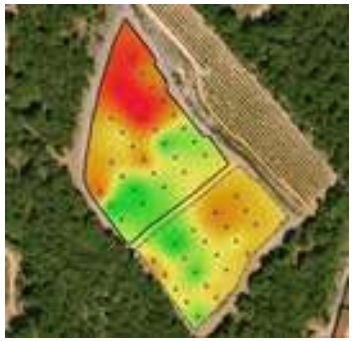


#DigitAg
The French Digital Agriculture Convergence Lab

Presented by **Hervé Monod**

INRA SCIENCE & IMPACT

Head : Véronique Bellon-Maurel, *Irstea*
Deputy head : Frédérick Garcia, *INRA*

DATAIA-JST International Symposium on Data Science and AI

11 July 2018

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ANR

Digital revolution and agriculture

- Rifkin J. (2012) : digital is the Third Industrial Revolution
  - For agriculture, digitalization is an exogenous innovation similar to *machinery* (19th century) and *chemistry* (20th century)
- Digital agriculture is a revolution : 3 simultaneous transformations
  - Technical and technological
  - Organisational
  - Social and societal
- An influence through three technological dimensions
  - Massive production and automation of data
  - Increase in power and efficiency of data processing
  - Increasing connections among objects and actors through ICT
- Meets key farmers' expectations
  - Economic performance
  - Environmental performance
  - Social issues
- A need to consider the whole agri-food system
  - Agri-food systems 4.0

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At the origin …

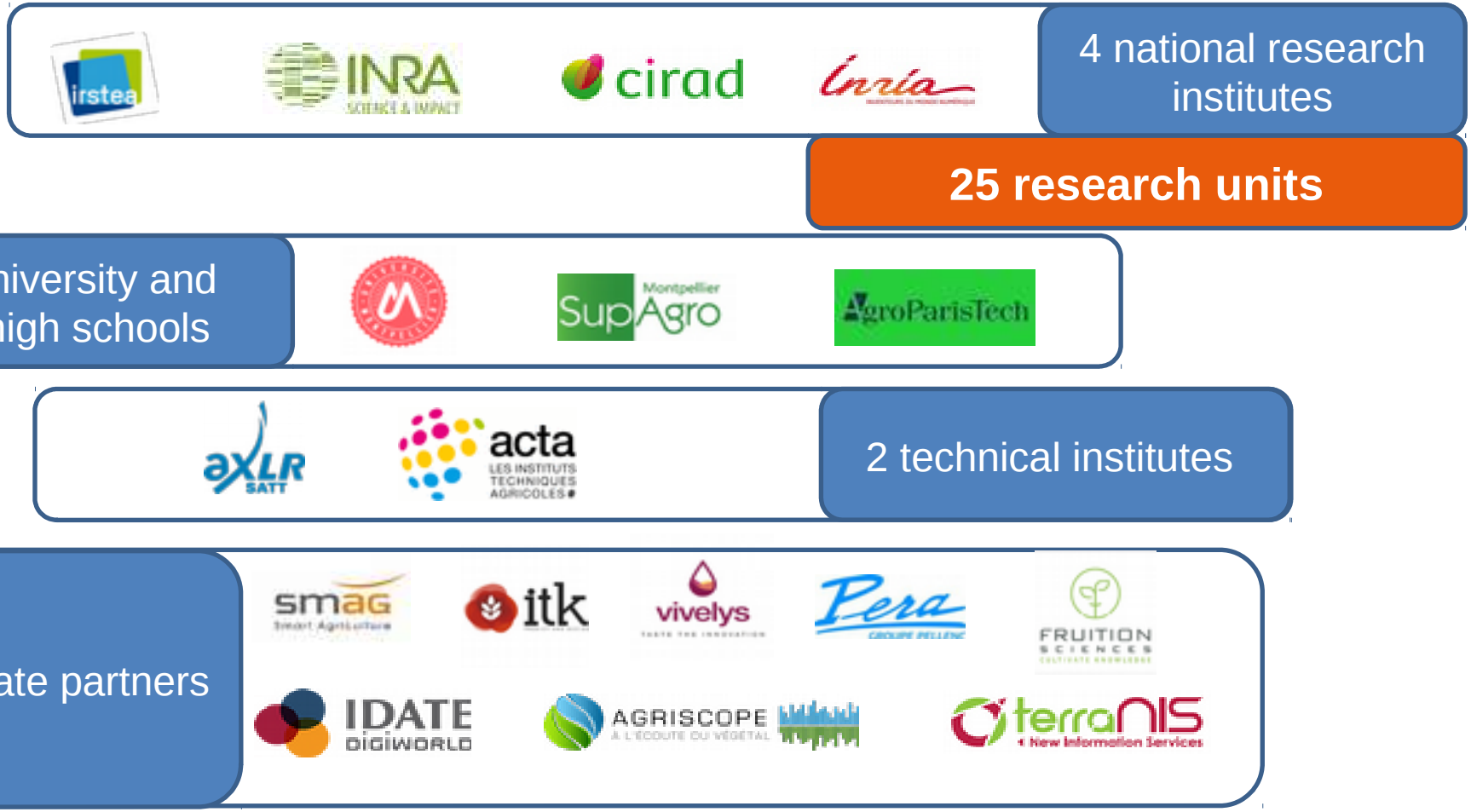
#DigitAg is one of the 5 projects selected by ANR in the 1st wave of « Instituts Convergences » (July 2016).

Duration : 7 years ; 2017 – 2023

Budget : 147 M€ including 9,9 M€ by ANR.

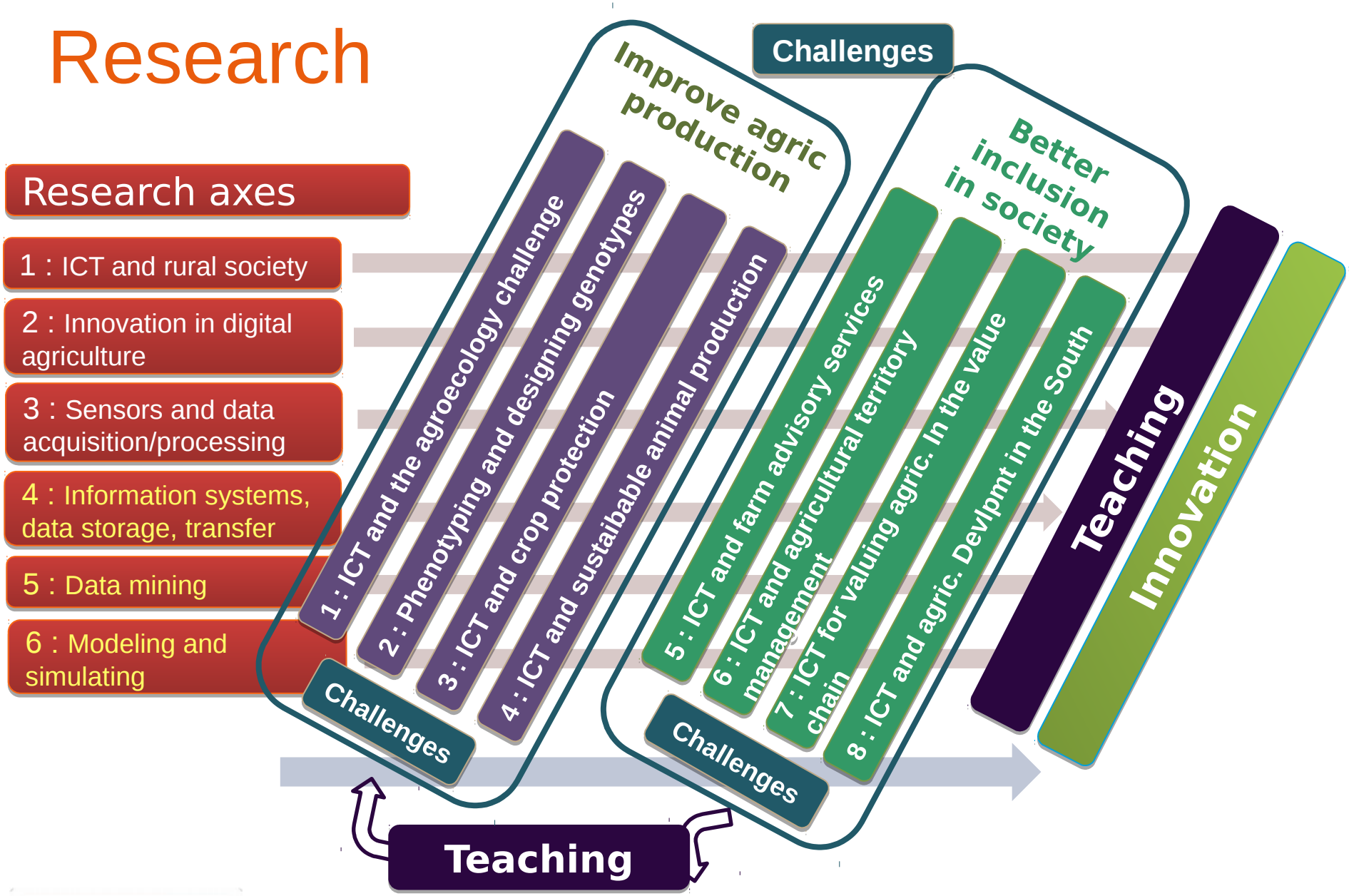
Centered in : MONTPELLIER (85%)
+ 2 satellite sites in Toulouse (INRA)
and Rennes (INRA et Inria)

#DigitAg => 17 partners



2017

Research


Research axes
1 : ICT and rural society
2 : Innovation in digital agriculture
3 : Sensors and data acquisition/processing
4 : Information systems, data storage, transfer
5 : Data mining
6 : Modeling and simulating
Challenges
Improve agric production
1 : ICT and the agroecology challenge
2 : Phenotyping and designing genotypes
3 : ICT and crop protection
4 : ICT and sustaibable animal production
Challenges
Challenges
Better inclusion in society
5 : ICT and farm advisory services
6 : ICT and agricultural territory management
7 : ICT for valuing agric. In the value chain
8 : ICT and agric. Devlpmt in the South
Challenges
Teaching
Innovation
Teaching
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Academic partners in ICT disciplines

- INRA (Mistea, MIAT) : mathematics, statistics and computer science, information systems
- Inria (ZENITH, GRAPHIK, LACODAM) : big data management, data mining, knowledge representation and inference, AI and decision support
- University of Montpellier (LIRMM, IATE, ZENITH, GRAPHIK) : mathematics and computer science, data mining, decision support

Challenges

- agricultural data → can be huge, heterogeneous and at multiple scales *(fields, greenhouses, omics, meteo, soils, etc.)*
- challenges for large scale data management, internet-of-things, inter-operability issues
- data cleaning and mining, machine learnin
- modeling and data assimilation
- robotics
- uncertainty and risk quantification issues for decision support

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Research | **Teaching** | **Innovation**

A graduate school

To get students closer to the professional world

Unique teaching courses

Unique wrt their objects

24 master courses and +, in sciences for engineer, agronomy, economics and management sciences …
Including sciences aimed at « South countries »

Unique wrt their mode

Project-based approach, reverse teaching, MOOCs

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Research

Teaching

Innovation

Innovation as a common thread

- SInce teaching
- In research projects
- With industrial partners and SATT

Novel devices to improve innovation culture

- Students awareness-raising
- Innovations sourcing
- Innovation maturation (SATT)
- Hackathons (1 or 2 per year)
- Pool of computer developers
- Observatory of digital agriculture

- Link with Mas Numérique
  Chaire AgroTIC
  the French Tech

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Le Mas numérique

La French Tech

Research

Teaching

Innovation

Produce more and better

Precision agriculture and breedin

Fast phenotyping

Advisory services

Better insert agriculture in our societies

Value chains

South countries

An exceptional research power

> 300 researchers and engineers
> 25 research units
> 56 supported doctoral theses
> 50 labelled doctoral theses
> 100 post-doc years
> 150 master grants
> 72 months foreign researchers
> 15 summer schools

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Stake I : Improve agricultural production

Chall. 1 : The agroecology challenge

Improve short and mid-term predictions of crop models by better taking account of uncertainties
ACTA & UR MIAT (INRA Toulouse)

Chall 2 : Fast phenotyping

Distributed scientific workflows for fast phenotyping of plants
Zenith (Inria et Université de Montpellier, LIRMM) & UMR LEPSE

Chall 3 : Crop protection

Optical sensor for characterising spray deposit
ITAP (Irstea), IES (Université de Montpellier), Montpellier SupAgro & IFV (ACTA)

Chall 4 : Sustainable animal productions

Use of data mining techniques to improve cattle herd management. LACODAM (Inria & PEGASE (INRA) – Rennes

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Stake II : Improve society inclusiveness

Chall 5 : New farm advisory services

Use of new IC Technologies in Africa : what new forms of advice and new training for farmers ?
Innovation (Cirad,), MRM (Université de Montpellier,), AGIR, AIDA

Chall 6 : Agricultural territory management

Driving crop models by remote sensing data at the farm and territory scales : comparison of tools for decision support in two wheat-based case studies in Australia and North Africa
SYSTEM (Montpellier SupAgro,) & TETIS (Cirad)

Chall 7 : Agriculture in the global value chain

Digital contribution for implementing price guarantees: application to cereal markets
MRM (Université de Montpellier) & UMR LAMETA, UMR ITAP et LIRMM

Chall 8 : Development in the South

Spatial yield estimation of a perennial West African crop : case of the mango tree in Senegal
Hortsys (CIRAD), labelled

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Partnership

EquipEx, Labex, SATT, Biotech, I-site

Europe

International openness
Graduate school

agropolis fondation
Labex Agro

Labex NUMEV

LABEX Entreprendre
Université de Montpellier

GEOSUD

Theia
Pôle Thématique Surfaces Continentales

PHENOME
Réseau Français Phénomique végétale
F P P N

Breed wheat

aMaizing

aXLR SATT

Montpellier Université d'Excellence

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