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## Connected agriculture: ARVALIS launches the “digifarm” project in partnership with IDELE, ITB and Terres Inovia

*Agriculture constitutes a promising market for the digital technology industry, including solution providers, agro-equipment suppliers, and robotics specialists. Those technologies bring innovation and enable producers to combine competitiveness, care for the environment and better working conditions. ARVALIS has therefore decided to support farmers who wish to implement those technologies and test connection tools in real conditions on two “digifarms”. Those farms will be used both as laboratories by the technical institutes, and as research centres and testbeds by established and start-up companies developing prototypes and tools. In short, the objective is to go from concept to application through using an open research approach.*

### Digital technologies: from concept to application

Agriculture lends itself perfectly to the use of digital technologies. Decision support tools, sensors detecting the state of plants, animals or the environment, agricultural machinery equipped with on-board sensors, robots, climate spatial modelling, new agricultural information repositories and new data processing tools: there is a multitude of techniques and data available to support precise, competitive and environmentally-friendly farming.

ARVALIS has already explored this subject and developed a recognised high level of expertise concerning big data processing, modelling of biological cycles, sensors, decision support tools, and automated agricultural guidance systems.

### Taking another step forward

With an increasing number of connection initiatives, tools and services already available to producers, or being developed, it is becoming crucial to find out how useful they are when being used in real conditions. Assessing their interoperability and ergonomic characteristics, linking the data gathered by the sensors to agronomic expertise, ensuring their use brings benefits: all this fits perfectly within Arvalis’s range of competence. However, the new factor is our desire to offer sites where the digital industry (start-ups, research institutes, established companies) can test and assess their tools and prototypes in order to demonstrate their operational qualities.

### Two “digifarms” serving as digital innovation playing fields

It is in that context that ARVALIS - Institut du végétal is going to specialise two of its farms as “digifarms”. The first one, in Boigneville, near Paris, is dedicated to arable crops, with three different production systems (organic, crops under permanent cover, and standard regional system). The second farm is located in Saint-Hilaire-en-Woëvre, in Lorraine, North Eastern France, in a mixed farming area with several crops and livestock, and produces beef cattle.

The work on each farm is focusing on four areas:

- the implementation of digital crop management combining existing tools and techniques;

- the development of digital tools that can be used directly on farms, under the control of the Institute;
- the testing of tools and prototypes offered by external companies;
- an idea incubator, offering digital innovation players an open, collaborative and relevant “playing field” where they can refine their designs.

The facilities should become progressively operational as of 2016.

### **Aiming for open sites and collaborative research**

The “digifarm” concept is a very important development of traditional research carried out in research stations, and is in line with an open and collaborative “farm lab” approach:

- in collaboration with technical institutes, especially those involved with arable crops and livestock (IDELE, ITB, Terres Inovia), as partners in this project;
- in collaboration with “research-farmers” engaged with this topic;
- in collaboration with companies, from start-ups to large groups, specialising in agriculture or not, that get given the opportunity to evaluate and trial their innovation as a farmer would use it;
- in collaboration with public research centres as well as the scientific and technical community. For example, ARVALIS is co-leading ACTA’s “digital group” and has recently decided to get involved in the Agreeen Tech Valley project.

### **A structural project that is part of a wider programme combining digital technology and agronomy**

ARVALIS’s two “digifarms” are part of the Institute’s wider programme focusing on applying digital technology to agronomy. This programme involves particularly:

- the Estrées-Mons site, in Picardie, Northern France, where the Institute is working on applying digital technologies to bring innovation into plant growing experiments: data recording, connected sensors, drone applications for non-destructive measurements in small parcels, etc.;
- the Mixed Technological Unit “CAPTE” in partnership with the INRA centre in Avignon, Terres Inovia and ITB, focusing specifically on close detection sensors and their agricultural applications in the areas of plant characterisation and crop management;
- the Phénome project (high throughput phenotyping), supported by Investissements d’Avenir, aiming to characterise plants precisely and to generate big data requiring specific processing.

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