

Molecular biology & biochemistry

Supporting variety and seed expertise

Testing

In 2018, BioGEVES analysed **26 000 samples**:

- 31% for regulatory testing
- 44% for private testing
- 24% for methodological research
- 1% other

Regulatory tests are carried out predominantly in support of variety registration and variety protection activities, with 95% conducted as part of DUS and VCUS testing. Other regulatory tests are carried out for the SOC (varietal control, 5%) and the DGAL (testing for GMOs in seeds).

Private tests are carried out in support of the sector and respond to a broad range of requests: variety identification, varietal purity, pathogen detection, antinutritional factors, verification of fatty acid composition, detection of GMOs. This covers a wide variety of species: vegetables, field crops, fruit trees.

Around **6000 samples** are analysed as part of methodological research, through some twenty research programs and actions to improve methods.

For BioGEVES, research accounts for around 25% of total working time, mainly for methods applied in DUS and VCUS testing and sanitary detection methods.

From a technical point of view our activity is organised in **three types of analysis** with a recent diversification of biochemical approaches:

- Detection of GMOs, detection of pathogens and resistance genes,
- Genetic labelling of varieties using molecular biology (BM) and electrophoresis,
- Analysis of biochemical constituents which, apart from chromatography, increasingly relies on NIRS technologies.

Method development

Detection in collaboration with the pathology laboratory:

- New method validated for identifying strains of *Pseudomonas syringae* pv. *pisi*,
- Project to develop *Ustilago nuda* detection in barley seedlings,
- Development of new pathosystems / resistance tests / detection methods, including the development of prescreening methods.

Genotyping:

- Improvement of the SNP marker chain (acceleration of data production, developments on cherry and apricot, new species such as Japanese plum and hemp, etc.)

Biochemistry:

- New CTPS testing method for the dosage of glucosinolates in oilseed rape by NIRS.

Inter Laboratory Comparisons

Organisation of ILCs:

- Dosage of glucosinolates in oilseed rape (HPLC and NIRS techniques)
- Dosage of fatty acids in sunflower, oilseed rape and mustard seeds (GPC technique)
- Dosage of protein content (DUMAS, NIRS, Kjeldahl techniques) and oil content in oilseed rape (NIRS and NMR reference chemical method)

Participation in ILCs:

Inter-laboratory proficiency and method validation tests organised by the InterProfessional Bureau of Analytical Studies (BIPEA), the United States Department of Agriculture (USDA), the European Network of GMO Laboratories (ENGL), the International Seed Testing Association (ISTA), and Naktuinbouw, in addition to the ILCs organised by BioGEVES.

Highlights 2018

BioGEVES has had another busy year with numerous testing requests, both internally for the SEV and SNES, and externally, including requests for specific development. There has been a strong increase in pathogen detection, biochemistry, and genotyping tests. Turnover is showing strong growth.

The "BioGEVES 2030" study commissioned by the GEVES management team delivered its conclusions, which were validated by the GEVES Administrative Council (July 12, 2018). These decisions frame future investments for the development of laboratory resources in terms of infrastructure and skills.

Perspectives 2019

Several research programs are planned for 2019 (oilseed rape-CPVO, tomato-CPVO). In terms of human resources, recruitments are planned to accommodate the sharp increase in activity.

With the validation of the BioGEVES 2030 project, in 2019 we will investigate works in order to improve our infrastructures. This study will concern both BioGEVES laboratories, in Beaucauzé and Le Magneraud.

Furthermore, BioGEVES remains committed to delivering quality services recognised by ISO 9001 and ISO 17025 standards, and its program of associated audits (COFRAC, AFNOR and internal).