

Technical Working Party on Testing Methods and Techniques

TWM/3/2

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REPORTS ON DEVELOPMENTS IN PLANT VARIETY PROTECTION FROM MEMBERS AND OBSERVERS
Document prepared by the Office of the Union
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1. The Technical Committee (TC), at its forty-seventh session, held in Geneva from April 4 to 6, 2011, agreed to request the Office of the Union to invite experts to submit written reports to the Office of the Union in advance of the Technical Working Party (TWP) sessions in order that a document containing those reports could be prepared by the Office of the Union. The TC noted that TWP experts would be invited to make a brief oral summary of their written report at the session and would also be encouraged to make reports under the agenda item “Experiences with new types and species”, as appropriate. The TC also noted that TWP experts would have an opportunity to raise questions concerning matters of interest (see document TC/47/26 “Report on the Conclusions”, paragraphs 9 and 10).

2. Written reports were invited by the Office of the Union in Circular E-24/148 of December 12, 2024. The following reports were received (in alphabetical order):

- ✓ Members of the Union: Annexes I to III: France, Netherlands (Kingdom of the) and the United Kingdom

[Annexes follow]

FRANCE

GEVES is the Examination Office of France, in charge of DUS and Value for Cultivation and Use (VCU) evaluation of new plant varieties, and in charge of quality testing of seeds.

GEVES website can be consulted here www.geves.fr

Description files can be found on the website for the varieties listed on the French catalogue. <https://www.geves.fr/catalogue-france/>

You can subscribe to our NEWSLETTER available both in French and in English to receive the latest information on GEVES's expert activities in plants and seeds, at national and international levels. Please subscribe here: <https://www.geves.fr/newsletter-en/>

The DUS activity, either in the framework of national listing, or PBR, or in the framework of international cooperation for DUS testing, has slightly decreased in 2024 compared to previous years.

Main activity remains on agricultural species. Detailed figures can be found on the annual report available on our website.

In total in 2024, GEVES carried out more than 3200 DUS cycles, mainly in its premises.

Crop sector	Number of DUS cycles in 2024	Main species tested
Agricultural	2350	Maize, oilseed rape, wheat, barley, sunflower, soybean
Vegetable	420	Lettuce, tomato, melon, cauliflower, pepper, squash
Fruit	240	Peach, vine, apple, sweet cherry, apricot, Japanese plum, pear
Ornamental	210	Hydrangea, Chrysanthemum, Buddleia, Nerium, Lavandula, Salvia, Echinacea

The International System of Cooperation for DUS is active and efficient. For more information, the international cooperation service of GEVES can be contacted here: clarisse.leclair@geves.fr and camille.zitter@geves.fr

In 2024, the international cooperation service of GEVES received more than 1100 applications, mainly from the European Union but also from all over the world. 72% of the requests are take-over requests and the DUS reports are then sent according to UPOV TGP/5.

In addition to that, the French National Office for PBR (**INOV**) has received 98 applications in 2024, out of which 98% were tested for DUS by GEVES.

INOV is involved in UPOV **PRISMA** for all genera and species. Contact INOV: inov@geves.fr

Regarding the use of **molecular markers**, GEVES is using in 2024 in routine molecular markers for the management of variety collection according to UPOV guidance model "Combining Phenotypic and Molecular Distances in the Management of Variety Collections", for maize, sorghum, spring barley, durum wheat. Projects are ongoing on Oilseed rape and being finalized for Hydrangea.

GEVES is also planning to use in routine for tomato DUS testing molecular markers for prediction of resistance to TSWV, ToMV: 0 and Fol: 1 and for lettuce DUS testing for prediction of resistance to LMV, in the framework of UPOV model "Characteristic-Specific Molecular Markers", in accordance with the technical guidelines in force. For more information on BMT, please contact: GEVES BIOGEVES rene.mathis@geves.fr.

Regarding the use of **disease resistance characteristics**, GEVES uses in routine disease resistance characteristics, processed in bio assays, for DUS results. In 2024, GEVES gave a presentation during the Sixtieth Session of the Technical Committee about its experience concerning the use of disease resistance characteristics in DUS examination, and this presentation is available on the UPOV website [here](https://www.upov.int/). GEVES provides also services, facilities, protocols, identified standards and strains for such activities to Examination Offices and seed companies, all over the world. For more information, please contact: GEVES SNES sophie.perrot@geves.fr

Regarding **digital phenotyping for DUS testing**, GEVES uses 2D image analysis on a routine basis, using detached plant organs that are scanned or photographed and then analyzed by AIM. GEVES is interested in developing the use of drones and stocks to phenotype certain DUS characteristics, such as plant natural height.

GEVES is involved in **several collaborative R&D projects** dealing with DUS, such as the EU founded project INVITE, and several CPVO co-funded projects:

- Harmorescoll: aiming at setting up a coordinated system at the European level to give access to reference material (isolates, controls and differentials) for performing disease resistance tests for DUS.
- Hydrangea project: "Harnessing molecular data to support DUS testing in ornamentals: a case-study on Hydrangea" ; it aims at developing an optimal molecular toolset that associates neutral and gene-specific markers to improve the management of the variety collection and secure field trials by checking the varietal identity of cuttings prepared from the variety collection before starting DUS examinations.
- ToBrAg, project to update DUS resistance tests (biotests and markers) according to pests' evolution with the practical cases of resistance tests to ToBRFV for tomato and pepper, and the resistance test to Aphis gossypii on melon.
- SNPsNAP: "SNP markers for guiding DUS testing in winter oilseed rape: Validating the new model". It is the second follow up of an earlier project which validated a set of SNP markers for KasPAR assays on bulk samples as a tool for the management of the variety collection (concluded in 2018).
- Lettuce project: International harmonization and validation of a SNP set for the management of lettuce variety collection.

[Annex II follows]

NETHERLANDS (KINGDOM OF THE)

Naktuinbouw Variety Testing developments

- The Unit Variety Testing includes a DUS team of 40 employees, one unit manager, and 4 employees specialized in disease resistance. Also, a support team, a trial management team with 2 cultivation managers and a project team. In total there are 70 employees and supplemented with temporary (circa 18) staff in summer. The unit works together with the teams of the unit Identity and Quality (laboratories) especially with Molecular Marker team and team Bioinformatics.
- In 2024 facilities for resistance testing have been expanded and a new drying and storage room has been built for onions.
- The Variety Testing Unit yearly offers a number of courses on Plant Breeders' Rights (PBR) and/or Listing. In 2025 many courses could be organised again in person.
- Applicants more and more use the online systems of UPOV and Community Plant Variety Office (CPVO) for filing their applications for listing and/or Plant Breeders' Rights. Nowadays it is possible to apply in the Netherlands (Kingdom of) for Plant Breeders' Rights as well as for Listing for all species using UPOV PRISMA.

Number of applications received

In 2024, 2514 applications were received for testing for the first year for National listing (NL), and for National or European Plant Breeders' Rights. Applications of the same variety for Listing as well as PBR, in vegetables and in agricultural crops are split in this table.

2024	NL listing	NL PBR	EU PBR	TOTAL
Agriculture	247	54	13	320
Vegetable	757	622	72	1487
Ornamental (incl. trees)		124	625	794
TOTAL	1004	800	710	2514

DUS projects

Digitisation

- Naktuinbouw continues to work on the expansion of the Naktuinbouw Academy: a digital training platform.
- Databases: Naktuinbouw develops SNP-databases in French bean, Hemp, Tomato and Lettuce. Some databases are developed nationally, others in international projects (e.g. IMODDUS). The projects are funded by amongst others the Dutch board for plant varieties and CPVO.

Projects

- Harmorescoll: in this project the reference material for obligatory disease resistance tests is harmonized. We expect that this work will be continues in 2025 and further.
- The EU project INVITE on the improvement on DUS and Value for Cultivation and Use (VCU). Naktuinbouw is one of the partners in this program. 2024 was the last year of this project. Naktuinbouw will continue with follow up project to get usable tools for Analysis with drones in Ryegrass, to use an app for some characteristics in tomato and to continue the work on common databases.
- Naktuinbouw continues to support IP Key projects.
- CPVO funds a project to develop a disease resistance test for ToBRFV in tomato and for *Aphis gossypii* in cucumber. Another project is to develop SNP marker set for lettuce together with Germany, Spain and France.

Other projects

Methodology projects that are funded by the Board for plant varieties in the Netherlands (Kingdom of the) are e.g.

- Marker development for fusarium (FOC1) resistance in brassica,
- Verification research on DNA combined with morphology in tomato and onion,
- Selecting similar varieties with image analysis and AI.

International cooperation 2025

- Since 2021, Naktuinbouw has participated in the Collaborative Seed Program in Nigeria. One of the project's goals is to set up a Plant Variety Protection (PVP) system in the country.
- In 2024 a project with Suriname has been started by the Makandra Program.
- We are participating in Advisory Committee for India – Bangladesh – Netherlands Seed Partnership. These two partnerships are initiative of SeedNL. Under India-Netherlands Seed Partnership, a delegation will visit Naktuinbouw in May. The focus of the visit is PBR and Inspections in the Netherlands. The visit is still being planned so dates are not final yet.
- Together with CPVO a visit to Netherlands (Kingdom of the) for the Bosnia and Herzegovina will be started (funded by TAIEX).

PVP Development Program (Toolbox)

- This tool helps countries develop, improve, and implement their Plant Breeders' Rights system. In 2024, different PVP projects were carried out in 11 countries and 12 projects were granted in 2025: Argentina, Armenia, Egypt, Ghana, Guatemala, Kazakhstan, Nigeria, Peru, PVP Toolbox Evaluation 2021-24, UPOV PRISMA support and Viet Nam.
- More info: PVP Development Program – PVP Toolbox | Naktuinbouw or contact: PVPToolbox@naktuinbouw.nl

Plant Breeders Rights training course.

- In Jan-March 2025, the training course on Plant Breeders Rights has been presented as an e-course with weekly online plenary sessions where the contents were discussed. This edition was attended by 9 students from Nigeria, Suriname and the Netherlands (Kingdom of the).
- In the remainder of 2025 and onwards, the course can be followed as an e-learning with tutoring per e-mail. Participants can register and start at any time throughout the year. The study load is around 80-100 hours, depending on prior knowledge.
- A hybrid version of this course (e-learning + 1 week practical training in the Netherlands (Kingdom of the)) may be organized in spring 2026, provided there is sufficient interest.
- More information: <https://www.naktuinbouw.com/knowledge-education/training-courses/plant-breeders-rights-for-food-security-and-economic-development> or contact l.pinan.gonzalez@naktuinbouw.nl

[Annex III follows]

UNITED KINGDOM

The Plant Variety Rights Office for the United Kingdom is part of the Animal and Plant Health Agency (APHA), an executive agency of the Department for Environment, Food and Rural Affairs (Defra) and its remit is to coordinate the delivery of variety listing and Plant Breeders Rights (PBR) in the United Kingdom. Contact details are available on the Gov.UK website: [UK Variety Listing and PBR](#).

In 2024 the United Kingdom received 1123 applications covering PBR and variety listing. The applications were made up of 443 vegetables, 516 agricultural, 107 ornamentals, and 57 fruit. Of these, 663 tests were not conducted in the United Kingdom, but carried out by UPOV members.

The United Kingdom will be implementing a customised version of the UPOV e-PVP administration module and DUS exchange module in 2025. This will further complement the use of UPOV PRISMA as the compulsory application pathway for PBR and variety listing in the United Kingdom.

DUS testing in the United Kingdom is conducted at Niab (www.Niab.com), AFBI (www.afbini.gov.uk), and SASA (www.sasa.gov.uk). Niab carry out the testing of wheat (winter and spring), Barley (winter and spring), Oats (winter and spring), Oilseed Rape (winter), Sugar Beet, Field Beans (winter and spring), Fodder Kale, and ornamental plants which include Chrysanthemum, Rose and a range of species of shrubs and herbaceous perennials. AFBI perform DUS testing of perennial ryegrass, Italian ryegrass, hybrid ryegrass and white clover. SASA conduct the DUS testing for potatoes, field pea, swede, turnip rape and vegetable peas.

The United Kingdom authorities are working together to develop a United Kingdom Plant Variety and Seeds (PVS) Strategy spanning PBR, plant variety listing, and setting standards for marketing and certification of seed and other plant propagating material, anticipated to launch in early 2026. This will be the first United Kingdom PVS strategy, and its development is an opportunity to engage with industry and other stakeholders to set out a shared vision, priorities, and actions to achieve these.

England is continuing work to implement the Genetic Technology (Precision Breeding) Act 2023 through the introduction of secondary legislation and consultation with industry. Furthermore, the DUS test centres are working with policy officials to ensure England has the capability to undertake DUS and VCU testing of precision bred plant varieties. The Act removes precision bred plants from regulatory requirements applicable to Genetically Modified Organisms in England.

The United Kingdom and Japan signed a Memorandum of Cooperation on the examination of plant varieties for the purpose of PBR. The MoC covers the exchange of examination reports for the granting of PBR and formalises current working practices between the United Kingdom and Japan, and came into operation on the 14th February 2025.

The United Kingdom continues to support the UPOV distance learning courses by providing tutors. Technical and administrative staff at our test centres take advantage of the distance learning opportunities through DL205 and DL305.

Colleagues across the United Kingdom have also benefitted from attending the two recent UPOV technical webinars. Hilary Papworth (Niab) presented in the first webinar on the subject of developing National Test Guidelines in the absence of a UPOV Test Guidelines.

Hilary Papworth continues in her role as the Chair of the UPOV Technical Working Party for Ornamental Plants and Forest Trees (TWO). As does Margaret Wallace (Niab) in her role co-ordinating a sub-group of the Technical Committee focussing on issues relating to Test Guidelines and the TG-Template.

To meet the challenges of climate change, the rapid development of new plant varieties for our farmers and growers should be encouraged and facilitated. The United Kingdom is actively driving the implementation of new techniques to DUS testing through several collaborative or internal projects:

- The United Kingdom has been active partners in the European-funded [INVITE](#) (Niab, SASA and BioSS (Biomathematics and Statistics Scotland)) project, which finished in December 2024. As part of this, innovations have been produced in how genetic markers might be used in DUS. In particular, at the Technical Working Party on Testing Methods and Techniques (TWM), there will be a presentation on a new method for trial management using genomic prediction, demonstrated on wheat. There will also be a presentation on an

enhanced version of COYD for distinctness assessment in cross-pollinated crops. This embeds information on genetic similarity of varieties into the COYD analysis, giving more precise estimates of variety means. Finally, the method for assessing uniformity in cross-pollinated crops with genetic markers, which was presented at the TWM last year, was presented at the OECD Seed Schemes Technical Working Group (TWG) in January 2025 as an approach for varietal purity.

- The Agri-Food and Biosciences (AFBI) in Northern Ireland are coordinators of the 5-year Horizon 2020 (SFS-29-2018) [InnoVar](#) project. InnoVar aims to augment and improve the efficacy and accuracy of European crop variety testing and decision-making, using an integrated approach incorporating genomics, phenomics and machine learning. Data from our European-wide trial series will form the basis of a new, purpose built, variety recommendation tools. The project focuses on bread and durum wheat initially before applying the InnoVar approach to other crops. The project's consortium includes 21 partners across Europe, including United Kingdom partners ADAS, Agriculture and Horticulture Development Board (AHDB) and APHA. Key achievements include:

- Development of tools that demonstrate ways to improve the efficiency of plant testing practices utilising phenomics, genomics and machine learning.
- Demonstration of a template for harmonised VCU protocols across Europe and beyond.
- Provide a template for introducing measures of sustainability and resilience into performance testing.
- Provided a roadmap for transferring the InnoVar approach in wheat to other major crops, including perennial ryegrass.
- Developed the concept of High-Performance Low Risk (HPLRTM) categorisation of plant varieties.

- A revised version of DUST is nearly ready for release. This version includes an improved installation process and the new COYU with splines module. The software has been tested by the United Kingdom, the Netherlands (Kingdom of) and Finland. This was mainly successful but revealed that the Excel conversion function does not work outside of the United Kingdom. We are working to resolve this.

- The United Kingdom is starting the introduction of the new COYU with splines method. As part of this, guidance is being developed for dealing with extrapolation.

- Two projects, which have finished in March 2025, have been funded by Defra to explore the use of molecular approaches in DUS work. The first project on barley (*Hordeum vulgare*), has provided proof of concept for the use of molecular markers to predict DUS phenotypes, and to inform selection of similar varieties for the growing trials. A smaller marker set has also been identified and validated for seed stock authentications and varietal identification in barley.

In the second project on raspberry (*Rubus idaeus* L.), phenotypic and genotypic datasets were generated for a collection of over 100 red raspberry varieties to begin exploring the prediction of DUS phenotypes via machine learning approaches. The machine learning models developed showed promise in their ability to predict qualitative DUS characteristics, with further investigation required to validate the predictions on larger datasets, and to explore how the approach would be implemented in practice.

- NIAB has continued their investigation into the use of UAV (Unmanned Aerial Vehicles) within a DUS testing situation.

[End of Annex III and of document]