

Technical Working Party for Agricultural Crops

TWA/51/3

**Fifty-First Session
Cambridge, United Kingdom, May 23 to 27, 2022****Original:** English
Date: June 2, 2022

REPORTS ON DEVELOPMENTS IN PLANT VARIETY PROTECTION FROM MEMBERS AND OBSERVERS*Document prepared by the Office of the Union**Disclaimer: this document does not represent UPOV policies or guidance*

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-22/016 of February 22, 2022. The following reports were received (in alphabetical order):

- Members of the Union: Annexes I to V: European Union, Japan, Netherlands, New Zealand and the United Kingdom

[Annexes follow]

EUROPEAN UNION

CPVO STATISTICS AND FIGURES

Statistics for 2021

In 2021, the CPVO received 3 480 applications for Community plant variety rights, 653 applicants filed applications for CPVRs. In 2021, the distribution between crop sectors was as follows:

- Agricultural, 1190 applications (34,2%), previous year 979 applications (28.6%)
- Ornamental, 1 445 applications (41.5%)
- Vegetable, 578 applications (16,6%)
- Fruit 267 aapplications (7.7%).

In 2021, the CPVO Office granted 2 859 titles for Community protection; 29 583 titles were in force by the end of the year. National authorities from all over the world regularly base their decisions on applications for CPVRs on technical examinations carried out on behalf of the CPVO (international cooperation, takeover of reports). By the end of 2021 the CPVO provided 547 technical reports to different countries, the five countries from which most requests emanated were Ecuador, Canada, Switzerland, Russian Federation and Serbia.

Presidency

On 21 August 2021, the mandate of the CPVO President Martin Ekvad ended.

Francesco Mattina, former vice-President has been appointed as a new President of the CPVO.

Administrative Council (AC)

The AC met twice in April and October 2021 decided and took note on the following:

- Proposal for exploring involvement in initiatives under the EU IP action plan for PVR related activities.
- Update of the CPVO International Cooperation Strategy to align it with new policy objectives of the European Union
- The AC adopted the R&D strategy for 2021-2025: objectives of the previous strategy confirmed (promote BMT in DUS testing and variety identification, shared online databases, improvement and harmonization of CPVO technical protocols). In addition, the CPVO aims at getting involved in EU funded R&D projects like Horizon Europe.
- AC adopted extension of approach for simple hybrids to complex hybrids
- AC adopted the Guidelines on Variety Denominations with explanatory notes on Article 63 of Council Regulation (EC) 2100/94 of 27 July 1994 on Community plant variety rights entering into force on 1.1.2022.

CPVO – EUIPO study on Impact of the Community Plant Variety Rights System on the EU economy and the environment.

- Analogous to the EUIPO studies on the economic contribution of the other IP rights nevertheless it considers specific aspects of agriculture and horticulture, such as the contribution of the PVR system to the global competitiveness of EU farmers and growers and how it helps meet the European Commission's Green Deal objectives.
- The central finding with respect to output is that in the absence of the CPVR system, in 2020 production of arable crops in the EU would be 6.4% lower, production of fruit would be 2.6% lower, that of vegetables 4.7% lower, and finally, the output of ornamentals would be 15.1% lower.

- From a macro-economic point of view, without the added production attributable to CPVR protected crops, the EU's trade position with the rest of the world would worsen, and EU consumers would face higher food prices. Furthermore, the additional production of such crops translates into higher employment in EU agriculture. Specifically, wages of workers in the arable crops sector are 12.6% higher than they would have been in the absence of this system, while wages in the horticulture sector are 11% higher.
- The farmers/growers across the EU thus benefit from the innovations supported by the CPVR system.
- Many of the companies protecting their innovations with CPVRs are small and medium-sized enterprises (SMEs). These small companies (including physical persons who hold CPVRs) account for more than 90% of the registrants of CPVRs and hold 60% of all CPVRs currently in force
- The CPVR system makes not only an economic contribution to the EU economy, but also contributes to the fulfilment of the EU's environmental objectives. The annual greenhouse gas (GHG) emissions from agriculture and horticulture are reduced by 62 million tons per year.

The detailed report on the study is published on the CPVO web site: [CPVO - EUIPO study shows positive impact of CPVR system on EU economy & the environment | CPVO \(europa.eu\)](#)

International affairs

The CPVO participated in several IP Key international outreach activities

- IP Key China
 - o Awareness raising seminar in November 2021: videos of the activity available on the [IPKey China website](#);
 - o Technical training on DUS in November 2021.
- IPKey Latin America: the licensing course was completed under the IPKey Latin America project in 2021 and will be promoted under the new phase of IPKey Latin America in 2022-2023. Moreover, the project concluded the Study on Ecuador, which will be as well presented under the new phase of the project.
- IPKey South East Asia:
 - o Webinar series in June 2021 on PVP and UPOV 91, presentations delivered available on the [IPKey SEA website](#);
 - o Training to Plant variety protection and intellectual property officials of Thailand in June 2021;
 - o Webinar on Plant Variety Protection and UPOV 1991 (January 2022)
 - o Workshop on support to beneficiary countries to accession to UPOV 91 (January 2022), presentations available on the [IPKey SEA website](#).

Other activities in South East Asia were carried out under the EAPVP Forum umbrella, such as the annual meeting held in September 2021 where the CPVO participated.

- AfrIPI: regional seminar on the Arusha Protocol. The activity is currently in a follow-up phase, ARIPO will circulate a survey among its Member States to collect information on short term plans with regard to the ratification of the Protocol.
- OAPI: the Office contributed by electronic means to national seminars for breeders, examiners and seed producers Libreville (Gabon), Brazzaville (Republic of Congo), Niamey (Niger) and N'Djamena (Chad). These seminars were funded by the European Commission.
- CarIPI: several activities have been carried out under the project in the Caribbean that ultimately led to the implementation of a parallel series of activities under a TAIEX project with the Dominican Republic, implementation started in 2022 with a first mission in March 2022 concerning Quality Audit Systems. The

focus of the TAIEX project is on capacity building on DUS matters. Under the CarIPI project the following activities were carried out:

- Webinar on independence in the conduct of DUS examination and managing of conflict of interest (6 April 2021)
- Webinar on establishing a functional PVR System (23 April 2021)
- Webinar on regional cooperation in PVR (28 September 2021). In the framework of this activity, we circulated as CPVO, UPOV and CarIPI a policy paper on enhancing regional cooperation in the Caribbean, followed by a survey on the single countries plans and ambitions in PVR matter.
- Caribbean week of agriculture (October 2021).

AGRICULTURAL SECTOR

Administrative Council decisions on agricultural TPs in 2021-2022 (AC meetings, written procedures)

Revisions of existing CPVO Technical Protocols:	
<i>Dactylis glomerata</i> L.	CPVO-TP/031/1
<i>Chenopodium quinoa</i> Willd.	CPVO-TP/328/1
<i>Trifolium pratense</i> L.	CPVO-TP/005/1
<i>Medicago sativa</i> L.; <i>Medicago x varia</i> Martyn	CPVO-TP/006/1
<i>Phleum nodosum</i> L.; <i>Phleum pratense</i> L.	CPVO-TP/034/1
<i>Cannabis sativa</i> L.	CPVO-TP/276/2
<i>Secale cereale</i> L.	CPVO-TP/058/1-Rev.
x <i>Triticosecale</i> Witt.	CPVO-TP/121/3

Statistics

The table hereunder shows the 10 most important agricultural crops over the last 6 years. In the long term, the order of the species is essentially unchanged except for Cannabis.

Species	2016	2017	2018	2019	2020	2021	Total (1995-2021)
Maize	201	177	262	229	173	325	5508
Wheat	183	144	178	166	164	154	2879
Oil-seed rape	126	94	103	120	149	92	1924
Potato	79	71	84	68	72	72	1880
Barley	69	72	93	100	75	57	1601
Sunflower	86	53	59	40	55	135	1300
Ryegrass	21	26	25	51	26	26	602
Sugar beet	28	9	19		11	6	393
Triticale.	19	17	20	21	16	17	304
Hemp	12	12	44	61	89	104	344
Total	824	675	887	856	830	988	

The agricultural expert meeting. (AEM)

The CPVO held its annual meeting with EU agricultural experts virtually in 29 and 30 September 2021. The meeting was attended by experts from eighteen examinations offices as well as by representatives of the European Commission, Euroseeds, Plantum and ECO-PB. The group discussed several DUS technical examination related topics, and technical protocols (see list above):

- Maize: Replacement of FAO numbers by time of flowering, field observations and further discussions confirmed that FAO maturity classes 500, 600, 700 of varieties grown in Italy can be replaced by corresponding notes 6 to 9 of the characteristic 'Tassel: time of anthesis'
- Wheat: Observation of the characteristics: Coleoptile: anthocyanin coloration and Ear: length of scurs and testing of wheat hybrids - the discussion kept for future due to the limited experience
- True Potatoes Seeds (TPS), discussions will continue in a course of 2022, two technical workshops take place at Naktuinbouw, presentation on progress and results of observation to be shared at next AEM
- Method used for cyclic planting in grasses, data collection to be continued and later shared also with TWC
- The outcome of a ring test in observation of barley and wheat characteristics, to continue with sharing the experience, technical workshop to be organised in future
- Characteristics with one single observation for species with multi-annual testing
- The proposal to update the number of plants to be observed to assess the ploidy characteristics, to update the Technical Protocols in question in conjunction with the reduction of the number of plants for the purpose of observation of the characteristic ploidy in upcoming reviews
- DUS assessment of oilseed rape hybrid varieties
- Additional information linked to the UPOV code to group varieties, no need for coordination at EU level
- The experts have been informed on the planning for the technical workshops to be organised in 2022, particularly to be dedicated to maize in Poland and TPS in the Netherlands.

R&D projects: the group received short updates on the advancement of the projects in the agricultural sector.

Ongoing projects R&D projects

'Developing a strategy to apply SNP molecular markers in the framework of winter oil seed rape DUS testing'

Based on a first project called "Test of the potential use of SNPs markers on oilseed rape varieties", this follow-up project was approved in March 2019 for a duration of 24 months. In the first project, GEVES (FR) and NIAB (GB) selected and tested on different matrices a set of 500 SNPs to design reliable KASPar assays and confirmed the possibility to reliably use bulk samples of seeds in rapeseed. In this project, they continue the work to produce large and consistent molecular data sets on a wide number of WOSR varieties to reach an optimized SNP set. In collaboration with Germany, existing UPOV models and newly developed ones will be tested to use these markers for DUS. The approaches are to be tested on the two different testing systems GAIA in France and COY in Germany. The results were presented and discussed with experts from all entrusted examination offices which were also partners to the pre-project. A second follow up project is foreseen in 2023 and would extend the genotyping to the whole collection and aim to validate and to apply the model chosen in the field. That implementation phase would include all entrusted EOs.

'Integration of molecular data into DUS testing in Durum wheat'

This project started in 2018 and ended in April 2021. The objective was to combine genotypic and phenotypic data to optimise the reference collection management by investigating the use of SNP markers of a commercial DNA chip. The coordinator was the Austrian examination office AGES. Project partners were INIA (ES); GEVES (FR); CREA-SCS (IT) and NEBIH (HU). Based on the results of the DURDUS field trials, it was concluded that a genetic distance between a candidate variety and a reference variety higher than 0,32 is a good indicator for distinctness. Such a clear conclusion on the threshold was, however, challenged when considering the results of the pairwise comparisons of the 2019-2020 DUS trials. To find a molecular threshold with a good compromise between safety and field savings, this issue needs further consideration. The partner EOs involved in an upcoming project (DURDUStools) will continue research in this area.

'DURDUStools - Integration of molecular data into DUS testing in durum wheat: development of a common online molecular database and a genetic distance calculation tool '

This follows up project started in January 2021 for a duration of 24 months. The aim of the follow-up project is to ensure the long-term usability of the results achieved in the DURDUS project, through the setup of a common online molecular database hosting DNA profiles of all varieties from the durum wheat reference collection and the development of an online genetic distance (GD) calculation tool available for the choice of comparators in DUS tests.

This new tool is being currently tested by the participating EOs.

‘Development of a SNP marker set in Cannabis to support DUS testing ‘

This follow-up project started in December 2019 for a duration of 24 months. Naktuinbouw as project coordinator submitted this project. Project partners were GEVES (FR) and NEBIH (HU). The CPVO applications for Cannabis sativa L. varieties are increasing steadily, particularly those bred for other than fibre and oil use. It is particularly demanding both in terms of time and money to import plant material for DUS testing of pharmaceutical varieties, which creates reluctance of titleholders to submit reference varieties. This project aims at continuing research work already undertaken by Naktuinbouw by identifying a SNP marker set for Cannabis. With the information and knowledge gathered in this project, a database could be setup in a follow up project to deploy a UPOV “French Bean” approach for the choice of the reference varieties to put in the DUS trials.

‘Exchange of views and potential follow up on the vmD (value molecular distinctness) approach for cross pollinated species‘

The experts received the presentation and agreed to get more information on the quantity of varieties concerned which had been rejected due to distinctness problems while having fulfilled the value requirements.

All reports of finalized R&D projects are published on the CPVO web site: <https://cpvo.europa.eu/en/about-us/what-we-do/research-and-development>

[Annex II follows]

JAPAN

1. Number of applications in 2021

Year	Number	(2021/2020)	Agricultural crops	(2021/2020)
1978 to 2021	35,932	-	2,676	-
2020	713		66	
2021	776	(108.8%)	59	(89.4%)

Top 5 of application for Agricultural crops in 2021

Rice 18, Potato 6, Sweet Potato 4, Hop 4, Maize 3, Ryegrass 3, Cocksfoot 3

2. Number of granted in 2021

Year	Number	(2021/2020)	Agricultural crops	(2021/2020)
1978 to 2021	28,823	-	2,222	-
2020	502		46	
2021	588	(117.1%)	48	(104.3%)

Top 5 of granted for Agricultural crops in 2021

Rice 19, Maize 6, Sweet potato 4, French bean 3, Sugarcane 2, Buckwheat 2, Potato 2, Hop 2, Tea 2

3. National test guidelines harmonized with UPOV TGs in 2022

Genera and Species (5)
Groundnut, Dieffenbachia, Radish, Tomato, Everlasting Daisy

4. National test guidelines developed for new genera and species in 2022

Genera and Species (7)
<i>Bauera rubioides</i> Andrews, <i>Berzelia</i> , <i>Boneset</i> , <i>Juniperus conferta</i> Parl., <i>Ligustrum sinense</i> Lour., <i>Pecteilis radiata</i> (Spreng.) Raf., <i>Strobilanthes anisophylla</i> (Wall. ex Hook.) T. Anderson

Web-site: http://www.hinshu2.maff.go.jp/info/sinsakijun/botanical_taxon_e.html

5. Other reports

- ✓ Regarding vegetative propagation plants, almost 400 plant species and genera were designated whose protected varieties were required the authorization of PBR holders on the propagation including the utilization of farm saved seed, even under the old Act. Furthermore, to enable PBR holders to exercise their rights effectively and refrain from the unintended outflow of their protected varieties overseas, Japan PVP and Seed Act was amended in December 2020 and took into effect on April 1, 2022. Under the amended PVP and Seed Act, any acts in respect of the propagating material of all protected varieties (including use of farm saved seeds) shall require the authorization of right holders. It resulted on the gradual increase of the number of applications for vegetables, such as tomato.
- ✓ Japan continuously provides other UPOV members with examination reports under the Memorandum of Cooperation (MOC). We have agreed the MOC with 15 members at April 2022. For example, MAFF and NCSS carrying out DUS examination for *Eutrema japonicum* (Miq.) Koidz. (syn. *Wasabia japonica* (Miq.) Matsum.) on behalf of CPVO.

- ✓ Since establishment of the East Asia Plant Variety Protection Forum in 2008, Japan continuously support Forum member's activities and will enhance support to establish effective PVP system consistent with the UPOV Convention. These cooperation activities are conducted under the 10-Year Strategic Plan of the Forum which has common direction to join UPOV member. Especially, Japan, Viet Nam and UPOV are working together on the pilot project to develop a single online application Platform "e-PVP Asia" for submitting one application data to multiple PVP Offices. "e- PVP Asia" includes the function to facilitate cooperation in examination among participating countries, that applicant can select country where DUS test would be done, and the report of the DUS test would be transferred to other countries. It is planned to launch "e-PVP Asia" at the end of 2022.
- ✓ Since 2016, based on the Memorandum of Understanding, Center for Seeds and Seedlings, NARO (NCSS) and Naktuinbouw have established Calibration Manuals for DUS technical harmonization. "Calibration manual for tulip" was finalized in 2022, and it will be published through both of websites. With addition of this, a total of 10 Calibration Manuals will be available for third country.

[Annex III follows]

NETHERLANDS

Naktuinbouw Variety Testing developments

- As from April 2021 the DUS team 4 junior DUS examiners joined the team to replace colleagues who retired or changed jobs. The DUS team now consists of 40 employees, including 2 managers and 4 in disease resistance. The Department of Variety Testing includes also a support team, a trial management team and a project team. In total there are 70 employees.
- The Variety Testing Department yearly offers a number of courses around Plant Breeders' Rights and/or Listing. Last year almost all courses have been provided as online-sessions (Zoom/Teams).
- During the COVID-19 crisis, the daily business of the employees of the Variety Testing department has not been disturbed. They succeeded to do the DUS work at the normal quality level and are also flexible in the contacts with the applicants.
- Applicants more and more use the online systems of UPOV and CPVO for filing their applications for listing and/or Plant Breeders' Rights. Nowadays it is possible to apply for Plant Breeders' Rights for all species through UPOV PRISMA as well as for Listing in the Netherlands. In 2021 35,2% of the National applications were filed by electronic means of the CPVO system, mainly due to a reduced application fee (in 2020 34%). Up to now we received a limited number of online applications through UPOV PRISMA.

Number of applications received

In 2021, 2655 applications were received for testing for the first year for National listing, and for National or European Plant Breeders' Rights. Applications of the same variety for Listing as well PBR, in vegetables and in agricultural crops are split in this table.

2021	NL listing	NL PBR	EU PBR	TOTAL
<i>Agriculture</i>	230	95	103	
<i>Vegetable</i>	662	529	74	
<i>Ornamental (incl. trees)</i>		213	749	
TOTAL	892	837	926	2655

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, rose, lettuce, onion, hemp, tomato and perennial ryegrass. 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.

EU projects: Database Melon, Harmorescoll and INVITE + Hemp

- An EU database for melon varieties is developed by cooperation between France, Spain, Portugal, Slovakia and the Netherlands. The development is funded by CPVO. In 2021 the project has been finished and continuation in cooperation is agreed.
- Harmorescoll: in this project the reference material for obligatory disease resistance tests will be harmonized.
- The EU project INVITE on the improvement on DUS and VCU. Naktuinbouw is one of the partners in this program.
- Starting a project on setting up resistance tests to ToBRFV for tomato and pepper and improvement of resistance test melon/*Aphis gossypii*

- International projects
 - Calibration manuals. Naktuinbouw cooperates since 2016 with NCSS Japan on the harmonisation of Dutch Calibration Books and Japanese Testing Manuals.
- Other projects
 - Study on minimum distances in tulip 2021-2023.
 - Studies on DUS and VCU testing in True Potato Seeds
 - Automatic morphological descriptions of ornamental crops through machine learning. <https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksinstituten/plant-research/biometris/show-biometris/MODOMA-Deep-Learning-in-sierteelt.htm>

International cooperation

- In 2021 online activities were carried out with Egypt, APSA, Mexico and Ethiopia.
- In cooperation with CPVO, Naktuinbouw joined the IPKey-project China. Training was organised digitally with direct translation.
- In 2021 a 4-year project is started by the Wageningen university on the Nigerian Seed sector. The Nigerian government and Naktuinbouw are involved on the topics of Plant Breeders rights and variety registration.

PVP Development Program (Toolbox)

- This is a tool to help countries to develop, improve and implement their Plant Breeders' Rights system. The first 5 years period has been finalized successfully. The Dutch Ministry has made another 5 years of funds available (2022-2027) for the implementation of this program.

More info: PVP Development Program - PVP Toolbox | Naktuinbouw or contact: PVPToolbox@naktuinbouw.nl

Plant Breeders Rights for Food security and Economic Development training course.

- In 2021, the course was presented in an online format. In 2022, the course will also be held online from Oct 3 – Dec 2.

More information: <https://www.naktuinbouw.com/bulb/training-course/plant-breeders%E2%80%99-rights-food-security-and-economic-development> or contact: l.pinan.gonzalez@naktuinbouw.nl

[Annex IV follows]

NEW ZEALAND

Applications for agricultural varieties in 2021/2022 have remained relatively consistent in comparison with previous years with around 30 applications a year. For 2022 to date, there have been 15 applications for varieties of pasture plants and amenity grasses, 13 applications for varieties of agriculture crops and one application for a variety of fungal endophyte.

The New Zealand agricultural system is based on an all-year, outdoor grazing system providing a steady number of applications for varieties of brassica (*Brassica rapa* L., *Brassica napus* L., and *Brassica oleracea* L.) and radish (*Raphanus sativus* L.) forage crops. The drive to reduce emissions from livestock seems to be increasing the interest in plantain and chicory breeding, species that are claimed to provide reduced greenhouse gas production in animals. New Zealand has carried out a few years of plantain (*Plantago lanceolata* L.) DUS trials, with further work required to optimise the national test guideline for this species.

New Zealand carried out the first balansa clover (*Trifolium michelianum*) DUS trial in the 2021/22 season and for the 2022/23 season will potentially run the first DUS trials for varieties of forage chicory, industrial hemp and quinoa. The species range is increasing for the agricultural varieties being tested and examined in New Zealand.

The revision of the kale (*Brassica oleracea* L.) test guideline (underway in the TWV) will help with standardising the fodder kale characteristics for a national test guideline. The Oil seed rape (*Brassica napus* L.) test guideline is also under revision. Oil seed rape is not a prominent crop in New Zealand however, it is often grown as a fodder crop. The revision of the oil seed rape test guideline will remove some of the standard leaf characteristics. For New Zealand, these leaf characteristics continue to be useful for distinctness for varieties of forage rape and will continue to be included in the national version of the rape test guideline adapted for forage varieties.

Due to the diversity of forage crops in New Zealand we regularly have new variety types to assess. The UPOV TG collection covers most of the genera and species required however the available test guideline may not have sufficient relevant characteristics useful for DUS in forage varieties. Sometimes it is necessary to utilise characteristics from different test guidelines of the same genus. In addition, information may be sort from other member states with experience of similar variety types belonging to that genus. Following the initial drafting of a national test guideline, the draft TG is utilised in the field for several seasons to optimise the final testing protocol for forage varieties.

The new Plant Variety Rights Bill is currently in the final stages of approval in the New Zealand Parliament. The new law will incorporate all provisions of the 1991 UPOV Convention and in addition addresses Treaty of Waitangi requirements with respect to New Zealand indigenous plant species. The new Act is expected to come into force later in 2022.

[Annex V follows]

UNITED KINGDOM

Report on the activity of the United Kingdom Plant Varieties and Seeds Office and the DUS examination centres of NIAB, SASA and AFBI. The Plant Varieties and Seeds Office 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 registration and Plant Breeders Rights (PBR) in the United Kingdom. Contact details are available on the Gov.UK website [UK Variety Listing and PBR](#).

It is our pleasure to host the 51st meeting of the UPOV TWA, in Cambridge.

In 2021 the United Kingdom received some 1400 applications covering Plant Breeders rights and National Listing. The applications were made up of 400 agricultural, 300 fruit, 525 ornamental and 175 vegetables. Around 500 of these applications required DUS testing in the United Kingdom with the remainder having DUS reports purchased from other countries.

As of January 2021, the United Kingdom is now processing all National List and PBR applications through UPOV PRISMA. Since its implementation, the United Kingdom has benefitted from UPOV PRISMA to process applications and has been working constructively with the UPOV PRISMA team to make further improvements. The United Kingdom are grateful to the UPOV PRISMA team for providing training workshops.

To demonstrate experience and competence in performing DUS testing at its three DUS test centres (NIAB, Cambridge; SASA, Edinburgh; and Agri-Food and Biosciences Institute (AFBI), Crossnacreevy), the United Kingdom has implemented a DUS Quality System based on internationally harmonised criteria.

Agricultural DUS in the United Kingdom is conducted at NIAB (www.niab.com) AFBI (www.afbini.gov.uk) and SASA (www.sasa.gov.uk). NIAB (formerly the National Institute of Agricultural Botany) 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) and Fodder Kale. AFBI perform DUS testing of perennial ryegrass, Italian ryegrass, hybrid ryegrass and white clover. SASA carry out the DUS testing for potatoes.

An industry stakeholder event was organised early March 2022 in conjunction with Defra, APHA, United Kingdom DUS examination centres and the British Society for Plant Breeders (BSPB). This well-attended and well-received webinar provided guidance and information on applying for Variety Listing and Plant Breeders' Rights in the United Kingdom as well an opportunity to engage, collaborate and receive feedback from national and international stakeholders.

In addition to the webinars, NIAB (on behalf of APHA) hosted an event for oilseed rape applicants in April 2022. A similar event will be arranged for cereal breeders in the coming months.

The United Kingdom continues to support the UPOV online courses by providing tutors. Technical and administrative staff throughout the United Kingdom take advantage of the distance learning opportunities through DL205 and DL305. Colleagues across the UK have also benefitted from attending the two UPOV seminars arranged in 2021 and the UPOV Technical Working Parties Preparatory Webinars.

The United Kingdom are actively driving the implementation of new techniques to DUS testing through a number of collaborative or internal projects:

AFBI are coordinators of the 4.5-year Horizon 2020 (SFS-29-2018) InnoVar project (www.h2020innovar.eu). 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, AHDB and APHA.

NIAB, SASA and BioSS (Biomathematics and Statistics Scotland) are active partners in the 5-year H2020 INVITE (Innovations in plant Variety Testing in Europe – www.h2020-invite.eu). INVITE aims to improve both efficiency of variety testing and the information available to stakeholders on variety performance under a range of production conditions and biotic and abiotic stresses. This will be exemplified on ten selected species

(apple, fodder grass, sunflower, soybean, wheat, maize, potato, tomato, oilseed rape, and lucerne) representing the main features of propagation, food and feed uses, and having an important breeding activity at EU level. There are 28 partners across Europe involved.

There is collaboration between InnoVar and INVITE. There is also liaison between INVITE and the recently established Australian INVITA project.

There are several projects within the United Kingdom investigating potential improvements to the testing system. For example, NIAB is using the wide range of expertise within the company to explore the use of club root resistance characteristics in oilseed rape DUS testing; UAV (Unmanned Aerial Vehicles) for data collection; molecular markers for reference collection management and trait analysis.

[End of Annex V and of document]