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| International Union for the Protection of New Varieties of Plants |  |

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| Working Group on Biochemical and Molecular Techniques  and DNA-Profiling in Particular  Seventeenth Session Montevideo, Uruguay, September 10 to 13, 2018 | BMT/17/5  Original: English  Date: September 5, 2018 |

Session to facilitate COOPERATION IN relation to the use of molecular techniques

Document prepared by the Office of the Union

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# Executive summary

The purpose of this document is to report on developments resulting from the discussion groups at the sixteenth session of the BMT to exchange information on their work and explore areas for cooperation in relation to the use of molecular techniques.

The BMT is invited to:

(a) note the information on developments resulting from the discussion groups at the sixteenth session of the BMT to exchange information on their work and explore areas for cooperation in relation to the use of molecular techniques, provided by the Netherlands and the United Kingdom, as set out in paragraph 11; and

(b) consider next steps on the basis of the outcomes of the discussion groups that will be held during the seventeenth session of the the BMT.

The following abbreviations are used in this document:

BMT: Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular

CIOPORA: International Community of Breeders of Asexually Reproduced Ornamental and Fruit-Tree Varieties

The structure of this document is as follows:

[Executive summary 1](#_Toc522180369)

[BACKGROUND 1](#_Toc522180370)

[DEVELOPMENTs since the sixteenth session 2](#_Toc522180371)

ANNEX I INFORMATION FROM THE NETHERLANDS

ANNEX II AGRICULTURAL DISCUSSION GROUP SUMMARY PREPARED BY THE UNITED KINGDOM

# BACKGROUND

At the sixteenth session of the BMT, held in La Rochelle, France, from November 7 to 10, 2017, discussion groups were formed for: agricultural crops; fruit crops; ornamental plants and forest trees; and vegetables, for BMT participants to exchange information on their work and explore areas for cooperation. (see document BMT/16/29 “Report”, paragraphs 48 to 53).

The BMT noted the following outcomes of the discussions:

*Agricultural Crops*

The United Kingdom to compile a list of crops of interest to members of the Union.

*Fruit Crops*

The following interest in cooperation was identified:

* Apple: Australia, Canada, France, Republic of Korea, United Kingdom, CIOPORA
* Stone fruit: France, Republic of Korea, Spain, United Kingdom
* Berries: Austria, Germany, Netherlands, United Kingdom, CIOPORA
* Nuts: China, Spain

*Ornamental Plants and Forest Trees*

Opportunities for cooperation on Rose to be explored by Netherlands (coordinator), China, United Kingdom and CIOPORA.

*Vegetables*

The following UPOV members would share their criteria for selecting crops for work in relation to the use of molecular techniques: Canada; China; France; Germany; Netherlands (coordinator); Republic of Korea; United Kingdom.

# DEVELOPMENTs since the sixteenth session

The Office of the Union received information from the Netherlands and the United Kingdom, copies of which are provided in document BMT/17/15 and the Annexes to this document as follows:

* Annex I Information from the Netherlands
* Annex II Agricultural discussion group summary prepared by the United Kingdom

The BMT, at its seventeenth session, will have a session for each discussion group, on the afternoons of September 11 and 12, 2018.

The BMT is invited to:

(a) note the information on developments resulting from the discussion groups at the sixteenth session of the BMT to exchange information on their work and explore areas for cooperation in relation to the use of molecular techniques, provided by the Netherlands and the United Kingdom, as set out in paragraph 11; and

(b) consider next steps on the basis of the outcomes of the discussion groups that will be held during the seventeenth session of the the BMT.

[Annexes follow]

INFORMATION FROM THE NETHERLANDS

**Criteria for building variety databases based on SNPs**

For which crops do we (start to) build databases, based on SNP?

1. crops for which we have each year a large number of new candidates or the presence of other finance sources
2. crops for which the current set of morphological characteristics does not sufficiently discriminate distinct varieties
3. crops where in the process of selection of reference varieties for the growing trial efficiency and/or a higher level of reliability can be achieved
4. vegetatively propagated crops for which a living reference collection is needed
5. crops for which environmental, phytosanitary or legal regulations complicate building a living reference collection
6. crops for which the database may have multiple use: not only for the DUS test, but also for inspection, certification, quality control, health, assistance in enforcement?
7. crops where DNA markers correlated to characteristics are applied
8. crops where we experience discussions on identity (during DUS test, infringement, complaint)
9. crops where international cooperation or harmonization is wanted or needed
10. crops for which the development of a SNP marker set is expected within reasonable time within reasonable expenses/costs (reference genome, ploidy, propagation method, sequence data in public databases, availability of DNA from earlier projects)

**Situation at Naktuinbouw (The Netherlands) in 2018**

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| --- | --- | --- | --- | --- | --- |
| **status** | **Crop group** | **crop** | **type** | **number of DUS tests per year** | **main criteria** |
| In use | Ornamental | Phalaenopsis | SSR | 130 | 1, 4, 9 |
| In use | Agricultural | potato | SSR | 50 | 1, 3, 4, 5, 9 |
| In use | Fruit | Raspberry | SNP | 0 | 6, 10 |
| In development | Ornamental | Rose | SNP | 140 | 1, 4 |
| In development | Vegetable | tomato | SNP | 120 | 1, 3, 7, 9, 10 |
| In development | Agricultural | Perennial ryegrass (Lolium perenne) | SNP |  | 1, 2 |
| In development | Fruit | Blueberry |  | 0 | 6 |
| In development | Trees | Elm (Ulmus) | SNP | 0 | 6 |
| In development | Trees | Fraxinus | SNP | 0 | 6 |
| Expected 2024 | Vegetable | French bean | SNP | 15 | 3, 9 |
| Expected 2024 | Vegetable | Onion/shallot | SNP | 30 | 3 |
| Expected 2024 | Vegetable | Lettuce | SNP | 150 | 1, 3,, 6, 7, 8 |
| Expected 2024 | Vegetable | Cucumber | SNP | 45 | 1, 3, 6, 10 |
| Expected 2024 | Ornamental | Chrysanthemum | SNP | 100 | 1, 4 |
| Expected 2024 | Vegetable | Pepper | SNP | 100 | 1, 3, 6 |
| Expected 2024 | Ornamental | Tulip | SNP | 80 | 1, 8 |
| Expected 2024 | Agricultural | Cannabis | SNP | 25 | 4, 5 |
| Expected 2024 | Vegetable | Melon | SNP | 25 | 3, 6 |
| Wishlist | Vegetable | Watermelon |  | 12 |  |
| Wishlist | Ornamental | Helleborus |  | 10 |  |
| Wishlist | Vegetable | Carrot |  | 20 |  |
| Wishlist | Vegetable | Spinach |  | 50 |  |
| Wishlist | Vegetable | Celery/celeriac |  | 8 |  |
| Wishlist | Vegetable | Bunching onion |  | 1 |  |
| Wishlist | Ornamental | *Gypsophila* |  | 3 |  |
| Wishlist | Ornamental | *Lilium* |  | 70 |  |

[Annex II follows]

AGRICULTURAL DISCUSSION GROUP SUMMARY PREPARED BY THE UNITED KINGDOM

The following technical platforms are used:

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| Technical Platform | Country |
| SSR (Capillary EP/DNA Barcoding) | UK, FR, BE, CZ,AT |
| SNP Kasp | FR, BE, CZ, UK |
| ISSR | FR |
| AFLP – Capillary | BE |
| NGS – RadSeq | AT |
| Large throughput | USA |

The following crops are of interest:

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| --- | --- |
| Crop | Interested Party |
| Barley | Austria, Canada, Czech Republic, Finland, Poland, United Kingdom |
| Cereals | Belarus, Canada, Finland, Poland |
| Clover | (Belgium) |
| Cotton | China |
| Durum wheat | Austria |
| Field Beans | United Kingdom |
| Hemp | Austria |
| Maize | Argentina, China, Czech Republic, Germany, United States of America |
| Oats | Finland, Poland, United Kingdom |
| Oilseed Rape/ Canola | Belarus, Canada, Czech Republic, Germany, France, United Kingdom |
| Peas | Canada, United Kingdom |
| Perennial Ryegrass | (Belgium), Netherlands, United Kingdom |
| Potato | Belarus, Canada, Germany, Netherlands, United Kingdom |
| Rice | China, Republic of Korea |
| Runner Beans | Austria |
| Sorghum | France |
| Soybean | Argentina, (Belgium), China, United States of America |
| Triticale | Finland, Poland |
| Wheat | Argentina, Austria, Belarus, Canada, China, Czech Republic, Finland, Poland, United Kingdom |

* Belgium was interested in data analysis only.
* Germany and France expressed an interested in all major EU agricultural crops, not just those listed above.

It was also suggested that ISF or ESA or similar breeders associations could be approached to request breeder co-operations.

[End of Annex II and of document]