UPOV

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

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OECD SEED CERTIFICATION SCHEMES

Document prepared by an expert from the Organisation for Economic Co-operation and Development (OECD)

Disclaimer: this document does not represent UPOV policies or guidance

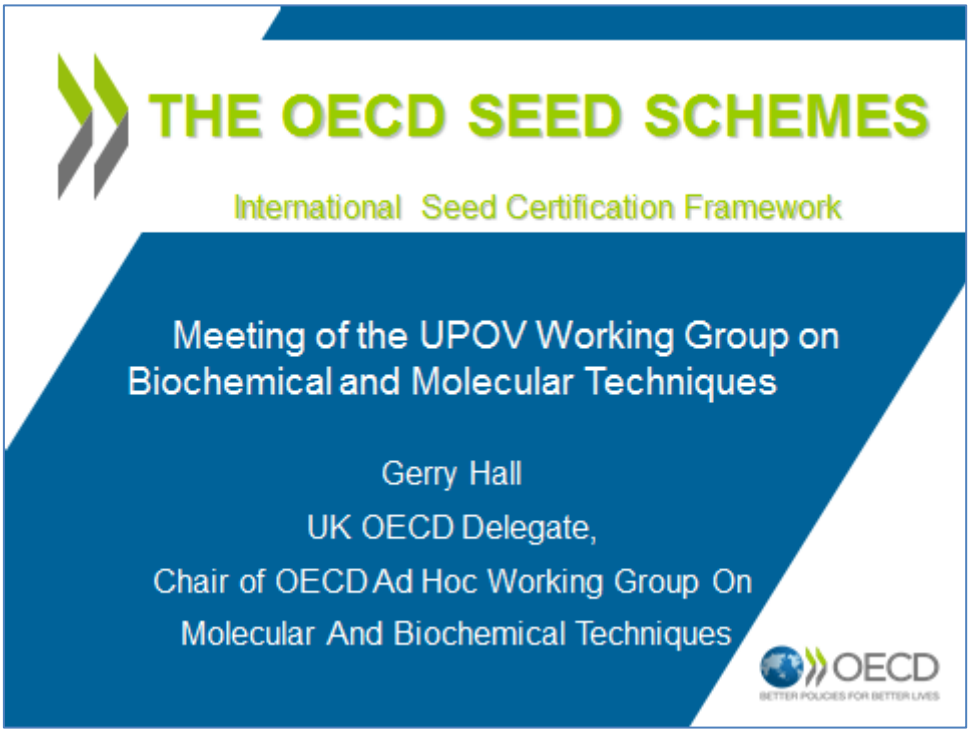
The Annex to this document contains a copy of a presentation on "OECD seed certification schemes", prepared by an expert from the Organisation for Economic Co-operation and Development (OECD), to be made at the sixteenth session of the Working Group on Biochemical and Molecular Techniques and DNA Profiling in Particular (BMT).

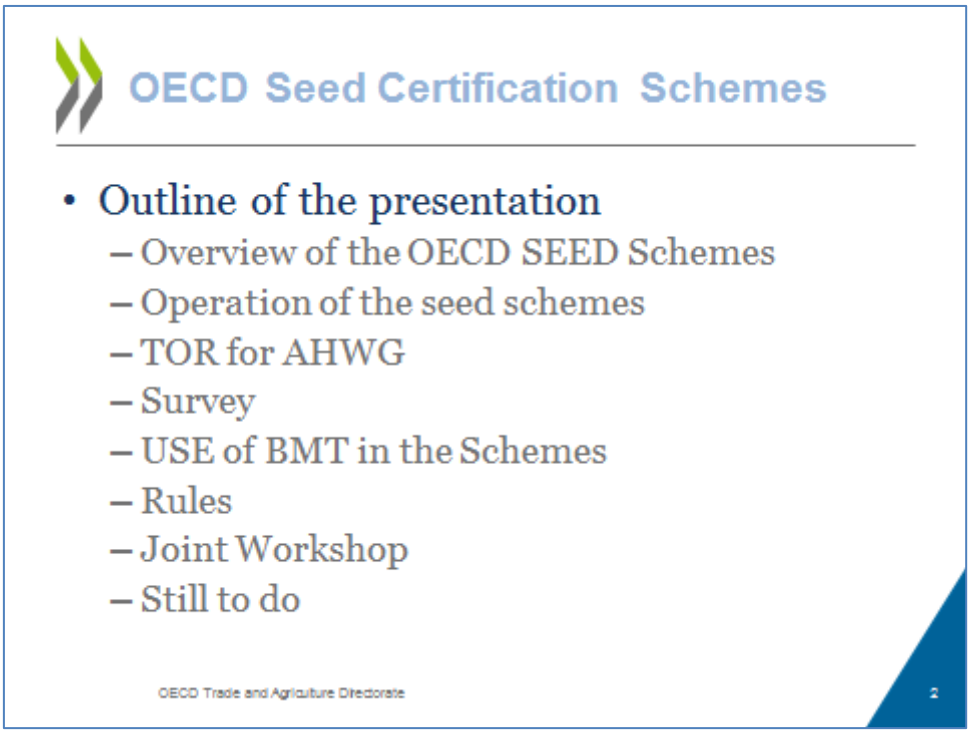
[Annex follows]

ANNEX

OECD SEED CERTIFICATION SCHEMES

Presentation prepared by an expert from the Organisation for Economic Co-operation and Development (OECD)





Organisation for Economic Co-operation and Development (OECD)

- Inter-governmental organisation
- Established in 1961
- 35 member countries

Better policies for better lives

A Global Policy Network

To improve national policies

Create international standards

Raise living standards

General overview of the OECD Seed Schemes

Formed **1961** (OEEC - 1958)

8 Schemes

61 Participating countries

62 000 varieties eligible for OECD certification

1 100 000 tons of OECD certified seed per year

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General overview on the OECD Seed Schemes - **8 Seed Schemes**

Grasses and legumes;

Crucifers and Other Oil or Fibre Species;

Cereals;

Fodder Beet and Sugar Beet;

Subterranean Clover and Similar Species;

Maize;

Sorghum;

Vegetables.

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General overview on the OECD Seed Schemes **Implementation**

National Designated Authorities implement the programme in member countries:

Registration of varieties on the list of varieties eligible for certification under OECD (after DUS and VCU tests);

Certification of varietal identity and purity:

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General overview of the OECD Seed Schemes

The OECD Seed Schemes seek to facilitate International trade in Seed through harmonised standards and varietal certification procedures

The OECD Seed Schemes Rules are updated / agreed by consensus at the Annual meeting.

Varietal certification procedures include generation control, varietal identity and varietal purity standards

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Operation of the Schemes

- Based entirely on
  - Crop inspection
  - Control plots
- National Listing of varieties is Required
- Schemes specify varietal purity characters for some 77 species

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Operation of the Schemes

- Characters are field based
- However, schemes recognise that it is not always possible to be definitive with varietal identity in a field situation
- Can be more problematic with varietal purity
- Request from some Members to use non field based characters
- OECD Annual meeting 2011 set up ah hoc working group to look at the problem and make recommendations
- OECD does not / will not develop any BMT methods

Terms of reference

- Carry out a survey of methods available to NDAs which will enhance ability to determine varietal identity/ purity / hybridisation
- Evaluate usefulness of these techniques and their validation
- Recommend relevant validated tests
- Recommend how seed schemes should use the techniques
- Recommend rules changes to facilitate the use of these tests

Survey

- 1st Survey carried out in 2012
- Membership was asked to list and provide information on any biochemical or molecular test that used
- From membership of 58, 26 replies were received;
- 6 replies were to note that no such tests were allowed in their Territories

Survey

- The list was updated in 2015
- Now to be updated Annually by the OECD Secretariat
- The 2017 list contains information from 26 of the Scheme's participating countries
- Trying to update validation / references for the tests.

Survey

- Survey information falls into 3 categories:
  - International Validation
  - National / other validation
  - No validation

Survey results (2016)

- Internationally validated tests:
  - 23 different species
  - 17 different NDAs

Survey Results - Internationally Validated

Avena sativa (oats)	Lolium (ryegrass)
Brassica napus (rapeseed)	Lolium multiflorum
B. Juncea (mustard)	Linum usitatissimum (flax)
B. nigra (black mustard)	Pisum sativum (pea)
B. oleracea L. var capitata (Cabbage)	Solanum lycopersicum (tomato)
B. oleracea L. convar. acephala (DC.) Alef. var. gongylodes L.; (Kohlrabi)	Solanum lycopersicum L. x Solanum cheesmaniae (L. Ridley) Fosberg Solanum pimpinellifolium L. x Solanum habrochaites S. Knapp & D.M. Spooner
B. oleracea L. var. gemmifera Zenker (Brussels sprout)	Solanum tuberosum (potato)
B. oleracea L. (broccoli / calabrese)	Triticosecale
B. oleracea L. convar. botrytis (L.) Alef. var. botrytis (Cauliflower)	Triticum aestivum (wheat)
Glycine max (soyabean)	Triticum durum (Durum Wheat)
Helianthus annuus (sunflower)	Zea mays (maize)
Hordeum vulgare (barley)	

Information for A. Sativa

Name of Test	Country	Purity	Identity	Hybrid-isation	Validated	If "yes" by whom	Reference
IEF PAGE	Germany	✓	✓		Yes	ISTA	Not Given
SDS PAGE	Germany	✓	✓		Yes	ISTA	Not Given
A- Page	Argentina	✓	✓		Yes	ISTA	Rule 8.8.6
	Czech Republic	✓	✓				
	Germany	✓	✓				
	Italy	✓	✓				
	Spain	✓	✓				
	United Kingdom	✓	✓				

Information for Brassica sp

SPECIES	NAME OF TEST	Country	Purity	Identity	Hybridisation	Validated	If "yes" by whom	Reference
Brassica napus (Rapeseed)	Fatty acid composition	France		✓		Yes	ISO Method	ISO catalogue
		Poland		✓				
	Determination of Glucosinolates Content	France		✓		Yes	ISO Method	ISO 9167-1:1992
		Poland		✓				
	Isozymes in starch gels	France		✓	✓	Yes	CPVO	Annex II.2 of CPVO TP/036/2
Brassica juncea (mustard)	Fatty acid composition and erucic acid quantification	France		✓		Yes	ISO method	ISO 8209: 1986
Brassica nigra (black mustard)	Fatty acid composition and erucic acid quantification	France		✓		Yes	ISO method	ISO 8209: 1986

Information for Triticum aestivum (wheat)

NAME OF TEST	Country	Purity	Identity	Hybrid-isation	Validated	If "yes" by whom	Reference
SDS - Page	Austria	✓	✓		Yes	UPOV	Part III of UPOV TG3/11
	Czech Republic	✓	✓				
	Denmark		✓				
	Germany		✓				
	Italy	✓	✓				
	Poland	✓	✓				
	Spain	✓	✓				
	United Kingdom	✓	✓				
A-PAGE	Argentina	✓	✓		Yes	ISTA	ISTA Rule 8.8.8
	Austria	✓	✓				
	Italy	✓	✓				
	Serbia	✓					
	Spain		✓				
Method for Determination of Phenol Reaction	Italy	✓	✓		Yes	CPVO	Ad 24 of CPVO - TP/003/4/Rev2
	Poland	✓	✓				
	United Kingdom	✓	✓				

Survey results - II

- National / other validated tests:
  - 21 different species
  - 12 different NDAs

Survey Results – National / other Validated

Avena sativa (oats)	Rice
Beta vulgaris (sugar beet)	Phaseolus vulgaris
Brassica napus (rapeseed)	Solanum lycopersicum (tomato)
Endivia	Solanum tuberosum (potato)
Glycine max (soyabean)	Sorghum
Helianthus annuus (sunflower)	Triticosecale
Hordeum vulgare (barley)	Triticum aestivum (wheat)
Lactuca sativa (lettuce)	Truiticum durum (Durum wheat)
Linum usitatissimum (flax)	Triticum spelta (spelt wheat)
Lolium (ryegrass)	Zea mays (maize)
Lupinus (lupins)	

Survey results - III

- Non validated tests:
  - 23 different species
  - 8 different NDAs

Survey Results – Non Validated tests

Allium cepa	Lactuca sativa
Avena sativa (oats)	Linum usitatissinum
Brassica spp	Lolium (ryegrass)
Brassica napus (rapeseed)	Lupinus luteus
Capsicum annuum	Panicum spp
Citrillus lanatus	Pisum sativum (pea)
Cucumis melo	Phaseolus vulgaris
Cucurbita maxima	Solanum melongena
Cucurbita pepo	Solanum tuberosum
Glycine max (soyabean)	Triticale
Helianthus annuus	Vicia faba (faba bean)
Hybrid cereals	

Information for Hordeum vulgare (barley)

NAME OF TEST	Country	Purity	Identity	Hybrid-isation	Validated	If "yes" by whom
Microsatellites	Austria	✓	✓		Yes	In house
Genotyping using microsatellite markers (SSRs)	Canada		✓		Yes	Canada (Canadian Grain Commission and CFIA)
Simple Sequence Repeats (SSR) molecular markers	France	✓	✓	✓	Yes	
Electrophoretic separation of hordein reserve proteins	Ukraine	✓	✓		Yes	Approved by Methodological Commission of the Ukrainian Institute for Plant variety Examination. Protocol No 5 of % March 2011

Use of Internationally Validated Laboratory Tests for Varietal Identity

Annual meeting has agreed that under certain conditions non- field based tests can be carried out:

- Complementary process to Field Inspection/control plot process only
  - Must in no way replace field Inspection/control plot
- That these techniques should not be compulsory, but under some circumstances could be used by those National Designated Authorities that wish to do so
- Will be applied by NDA in Country of multiplication at their discretion

Use of Internationally Validated Laboratory Tests for Varietal Identity

- Only Internationally validated tests are considered
  - Hopefully so results are repeatable so as to avoid disputes between NDAs.
- Apply to any category of seed
- Methods to be used for Identity only
- Annual Meeting to approve (note) specific tests for specific species

Use of Internationally Validated Laboratory Tests for Varietal Identity

- That where a variety description includes an internationally validated test, it can be used as part of the OECD process
- Proposed wording to change Part III of the Guidelines
  - To clarify the circumstances under which BMT methods can be used

Rules

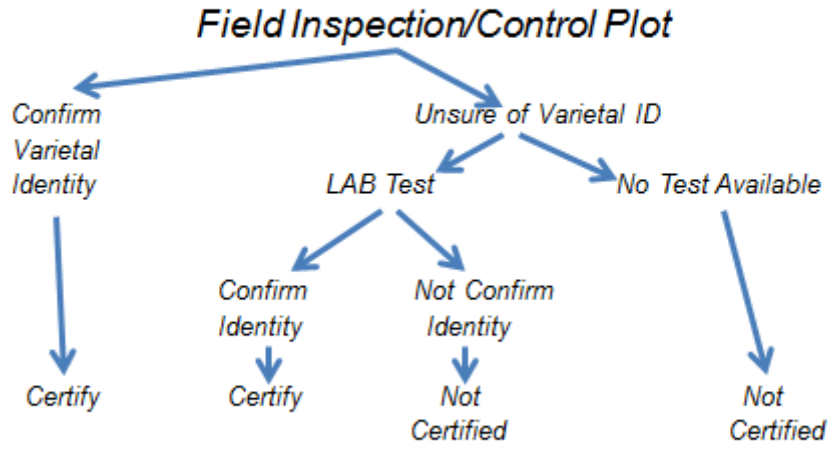
- Looked at changing rules to make the use of BMT methods clearer
- Not able to agree a change to the common rules
- BMT methods currently being considered under the existing Rule 7.4.5 "Other controls as appropriate":

The National Designated Authority is entitled to make any other tests appropriate to the variety concerned and to obtain any information required for the certification of each seed lot.

ISSUES

- Membership has been unable to agree precise conditions under which such tests can be used.
- Is "Internationally validated" correct term to use?
- Annual meeting wants to ensure that any such tests are in ADDITION to field inspection and control plot tests.
- Only where there is doubt
- Legal issues in some countries in using characters/tests that are not part of the variety description at Registration.

Use of Internationally Validated Laboratory Tests for Varietal Identity



Other initiatives

Co-operation with other International Organisations:

- OECD held a joint OECD/UPOV/ISTA/AOSA WORKSHOP on biochemical and molecular methods in Paris on 8 June 2016
- Designed to bring OECD up to speed with developments the other organisations

Workshop Conclusions

- To develop a joint document explaining the principal features (e.g. DUS, variety identification, variety purity, etc.) of the systems of OECD, UPOV, AOSA and ISTA and, for mutual understanding, to repeat the joint workshop at relevant meeting of ISTA.
- To carry out a joint inventory by UPOV, OECD, AOSA and ISTA of the use of molecular marker techniques, by crop, with a view to developing a document containing that information. The OECD could contribute to the document by sharing the ongoing list of molecular techniques used by NDAs and collected / updated annually by the OECD Secretariat.
- To develop a list of terms and their definitions as used by OECD, UPOV, AOSA and ISTA and to make an attempt to harmonise these.
- To consider organising another similar workshop in three years' time.
- To consider if using the term "internationally validated" is still appropriate and if it should be replaced by another term such as "internationally harmonised" methods.

Further tasks

- Is Internationally validated the correct term to use?
- Conditions for varietal Purity
- To recommend how internationally validated laboratory tests can be "approved"
- If each test is suitable for varietal identity or purity or both

[End of Annex and of document]