Report of the proficiency test committee

Didier Demilly (PTC chair), Branislava Opra (Standard PT coordinator & PTC observer)

The strengths of the Proficiency Test Committee (PTC)

PTC Members / PT Leaders

Didier Demilly (chair) - FR
Sharon Davidson (vice-chair) - USA
Susanne Andersen - DK
Sarah Dammen - USA
Leanne Duncan – CA
Irena Gera – PL
Monika Holubicová – SK
Michaela Gheorghe - RO
Gillian Musgrove - UK
Sergio Pasquini - IT
Elena Perri – IT
Branislava Opra (observer)
Adrienn Abos – HU (new member)

ISTA Secretariat

Branislava Opra Standard PT coordinator
Stella Marcu PT administrator
Florina Palada, Head of accreditation and technical department

TCOM relationships

Collaboration exchanges:

- programme plan
- follow up actions
- questions, etc

PT Program 2023 -2025

Round	Species	Test round scope	Crop group	Crop group	PT Leader
PT23-1	*Vicia sativa*	PUR, OSD, GER	4	Pulses	Monica Holubicova
PT23-2	*Raphanus sativus*	PUR, OSD, GER, MOI, VIG (conductivity test), OIC	5 (and 6)	Other agricultural crops and vegetable	Gillian Musgrove
PT23-3	*Trifolium hybridum*	PUR, OSD, GER, TSW	3	Small legumes	Susanne Anderson
PT24-1	*Triticum aestivum* subsp. *aestivum*	PUR, OSD, GER, MOI, TZ, VIG (radicle emergence), TSW, OIC	2	Cereals	Sarah Dammen
PT24-2	*Matthiola longipetala*	GER	8	Flowers	Irena Gera
PT24-2	*Arachis hypogaea*	GER	4	Pulses	Claudia Falch
PT24-3	*Lactuca sativa*	PUR, OSD, GER	1	Vegetables	Mihaela Gheorghe
PT24-3	*Coriandrum sativum*	GER	6	Vegetables	Sharon Davidson
PT25-1	*Beta vulgaris* * (pelleted seeds)	GER, OIC	5	Other agricultural crops	Adrienn Abos
PT25-1	*Festuca rubra*	PUR, OSD, GER,TZ	6	Grasses	Leanne Duncan
PT25-2	*Oryza sativa*	PUR, OSD, GER, TZ, TSW OIC	2	Cereals	Elena Perri
PT25-3	*Pinus sylvestris*	GER, MOI, TZ	7	Forest	Sergio Pasquini
PT25-3	*Chenopodium quinoa*	GER	5 (and 6)	Other agricultural crops and vegetables	Didier Demilly

2023 Key data

Round	Species	Test round scope	PT Test leader	Sample number	Number of participants
23-1	*Vicia villosa*	P, OSD, G	Monika Holubicova	3 x 220	184
23-2	*Raphanus sativus*	P, OSD, G, M, VIG (CT), OIC completion	Gillian Musgrove	3 x 250	209
	MIX for training	Purity Committee		200	
23-3	*Trifolium hybridum*	P, OSD, G, TSW	Susanne Andersen	3 x 230	181
Total	**27 heterogeneity tests** **24060 seeds added for the OSD** **ISTA secretariat :** **51 statistical analysis & 2321 individual reports**		**3 PT leader**	**2100**	**574 participations**

Noticeable results: PT23-2 *Raphanus sativus*
Conductivity - 63 participants
(21 accredited and 42 volunteers)

Thanks to STA committee :
New Excel file for heterogeneity test
check of homogeneity by the PT Leader

Specific conductivity method for *Raphanus*,
specific tolerances for species in Table 15A.2

Species	Containers to be used	Sample size	Seed moisture content	Water volume	Temperature	Soak time
15A.2						
Raphanus sativus	Tubes 7–8 cm high with a diameter of 4 cm	4 weighed replicates of 100 seeds	No adjustment	40 ml	20 °C	17 h

Noticeable results: PT23-2 *Raphanus sativus* - Conductivity

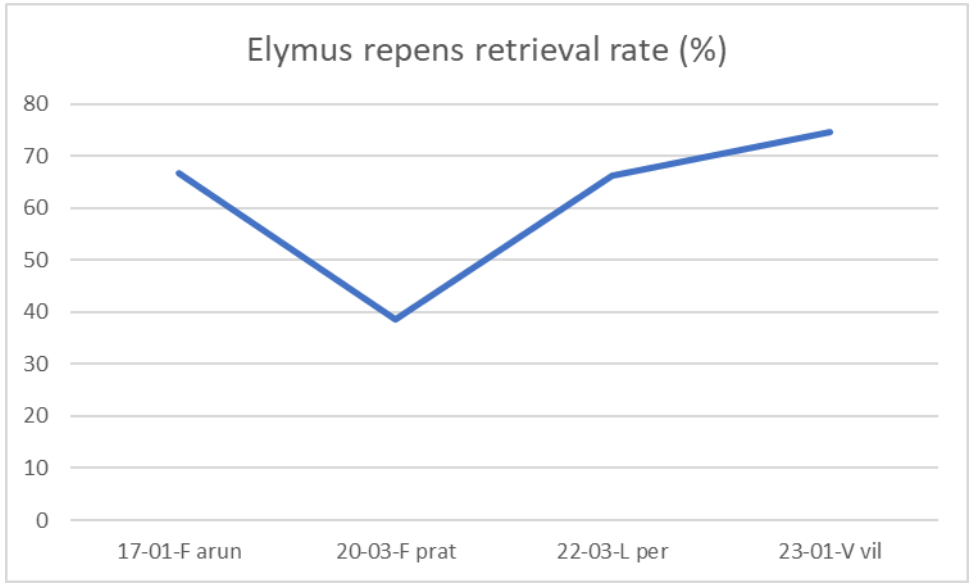
High means and standard deviations			Mean			Standard deviation			Potential rating
		PT test round	mean_l1	mean_l2	mean_l3	sd_l1	sd_l2	sd_l3	
		14-1 P.sat V	18.49	18.35	24.24	2.52	2.74	3.8	
		20-1 P.vul	43.36	60.45	53.16	7.75	6.37	6.37	
1st test	**63 participants (21 obligatory)**	23-2 R.sat	140.97	138.68	81.7	**54.86**	**43.23**	**32.53**	1C & 1 BMP
2nd test	**36 participants**	23-2 R.sat V	139.71	145.59	81.27	**27.19**	**27.53**	**4.8**	1C & 22 BMP

Hypothesis: Potential effect of transport of the seed lots between countries;
Imbibition damage in the form of dead or damaged tissue on the cotyledons will lead to higher leakage

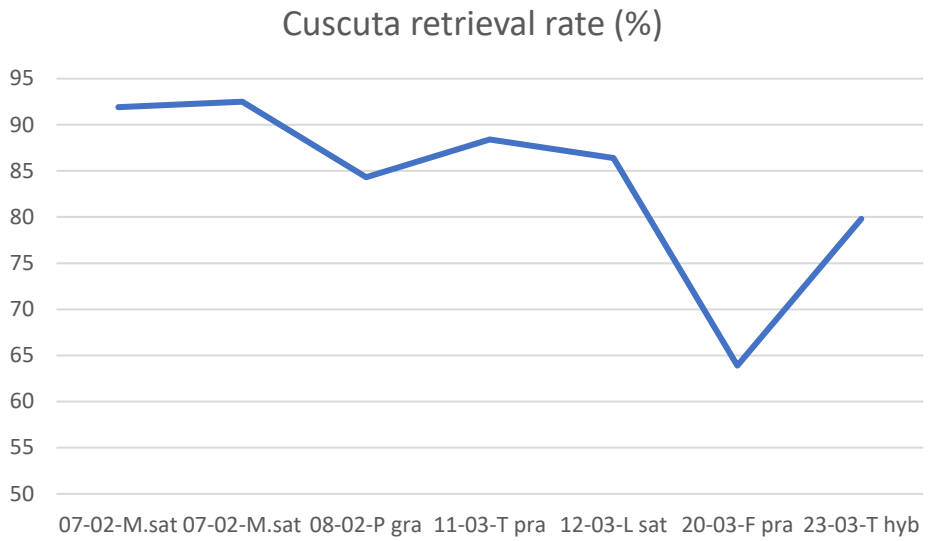
Method: Not prescribed method use by some laboratories
for example 13 laboratories used probes with constants of 0.01 to 0.5 (1.0 recommended in the rules)

Results of this test cancelled !

Noticeable results – OSD PTs in 2023



23-1 *Vicia villosa*
Lot1 : *Elymus repens* 2 seeds
Retrieval rate 74.6%



23-3 *Trifolium hybridum*
Lot 3 – 4 *Cuscuta* sp.
Retrieval rate 79.80%

More than 100 years of comparative seed tests

1938 Germination 49 participants 5 samples
ISTA President conclusion «*Uniformity of results far from achieved*»

1950 Referee test 63 participants «*quite satisfactory for purity*»

1956-1972 «*Referee testing on association wide basis*»
Based on 7 regions. Detailed reports 27 pages in 1960

1977-1983 Referee Test Committee chair by Atilio Lovato (Italy)

- First computer program
- First procedure
- Referee test with 137 participants including 107 authorized to issue ISTA certificates
  1731 samples sent directly by referee test leaders

1983-1989 Referee test committee chaired by DJ Scott (New Zealand)

- More comprehensive laboratory membership
- If needed Laboratories must initiate their own follow-up and corrective actions

More than 100 years of comparative seed tests

1989-2001 Referee test chair by A.B. Ednie

- Move of the computer programme from New Zealand to ISTA Secretariat and improvement of the programme
- Mini referee test for candidate to issue ISTA certificates
- The referee/ proficiency test programme was initiated and harmonized with the new laboratory accreditation scheme under ISTA Secretariat and Referee Committee become Proficiency Test Committee.

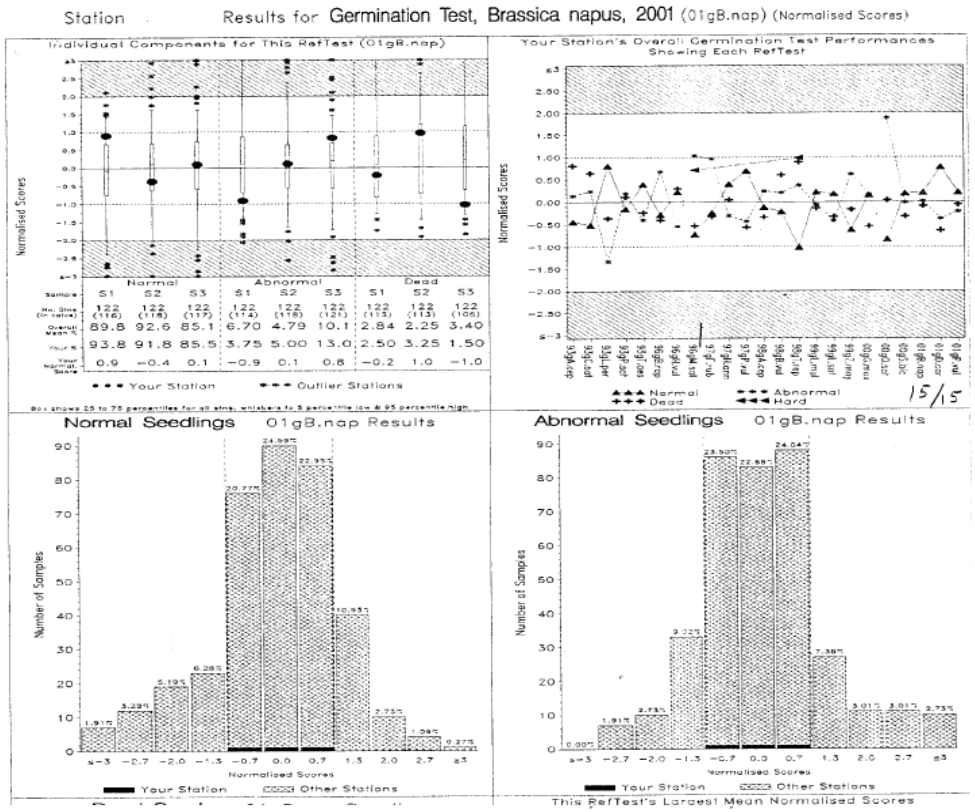
January 1st, 2003 the Referee Test Committee lead by Doug Ashton (Chair from 2001 to 2003)

- The data base was updated by Dr. Michael Kruse and the first Proficiency tests data in it in 2002
- The new referee/proficiency test program was presented and discussed during the ISTA statistics seminar in 2002, Corvallis, Oregon
- The use of E mail accelerated PT preparation and report to participants.

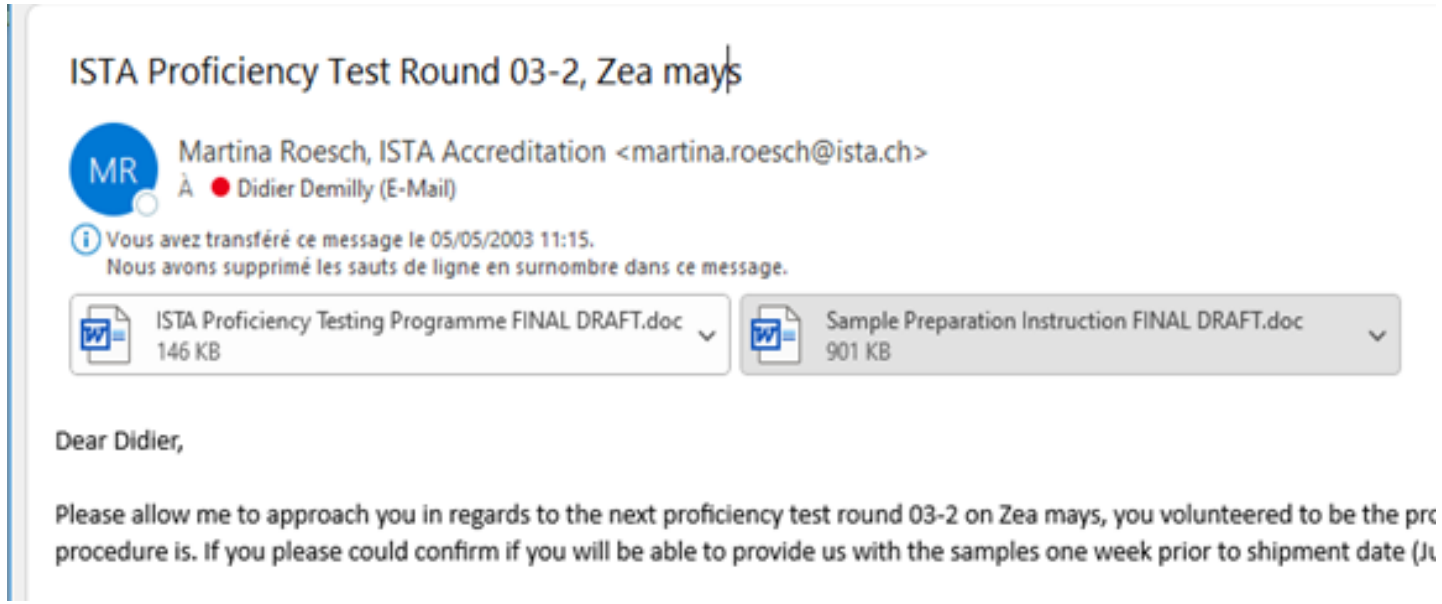
More than 100 years of comparative seed tests and 20 years of current data base

Martina Roesch, Head of the Accreditation
ISTA Secretariat, 10.04.2003:
E mailing instruction to PT leaders

Reporting from the data base Brassica napus 2001



Oregon, June 25, 2002



E mailing results to participants instead postal letters started in 2014

Günter Müller (chair from 2003 to 2017) implemented and improved the programme

More than 20 years of data in the current database

Introduction of the ISTA crop groups in the Standard PT Programme

year (since)	crop group	number of PT rounds until 2025
2001	other agricultural	16
2002	pulses	16
2003	cereals	16
2003	small legumes	9
2003	vegetables	10
2004	grasses	14
2005	flowers	7
2013	forest and shrub	5
TOTAL NUMBER of PT rounds		**93**

Most analysed species in PTs since 2001

species	PT number
Oryza sativa	8
Pisum sativum	8
Triticum aestivum subsp. aestivum	6
Brassica napus	5
Hordeum vulgare	5

More than 20 years of data in the current database

Introduction of the tests in the Standard PT Programme

Year (since)	Tests	number of tests until 2025
2001	purity and other seed identification	55
2001	germination	85
2002	vigour (4 radicle emergence, 6 electroconductivity tests)	10
2003	Moisture (11 no grinding, 5 fine grinding, 5 coarse grinding, 1 cutting)	22
2004	viability (tetrazolium test)	23
2004	compliting ISTA Certificates	24
2020	1000 seed weight test	5
	TOTAL	**224**

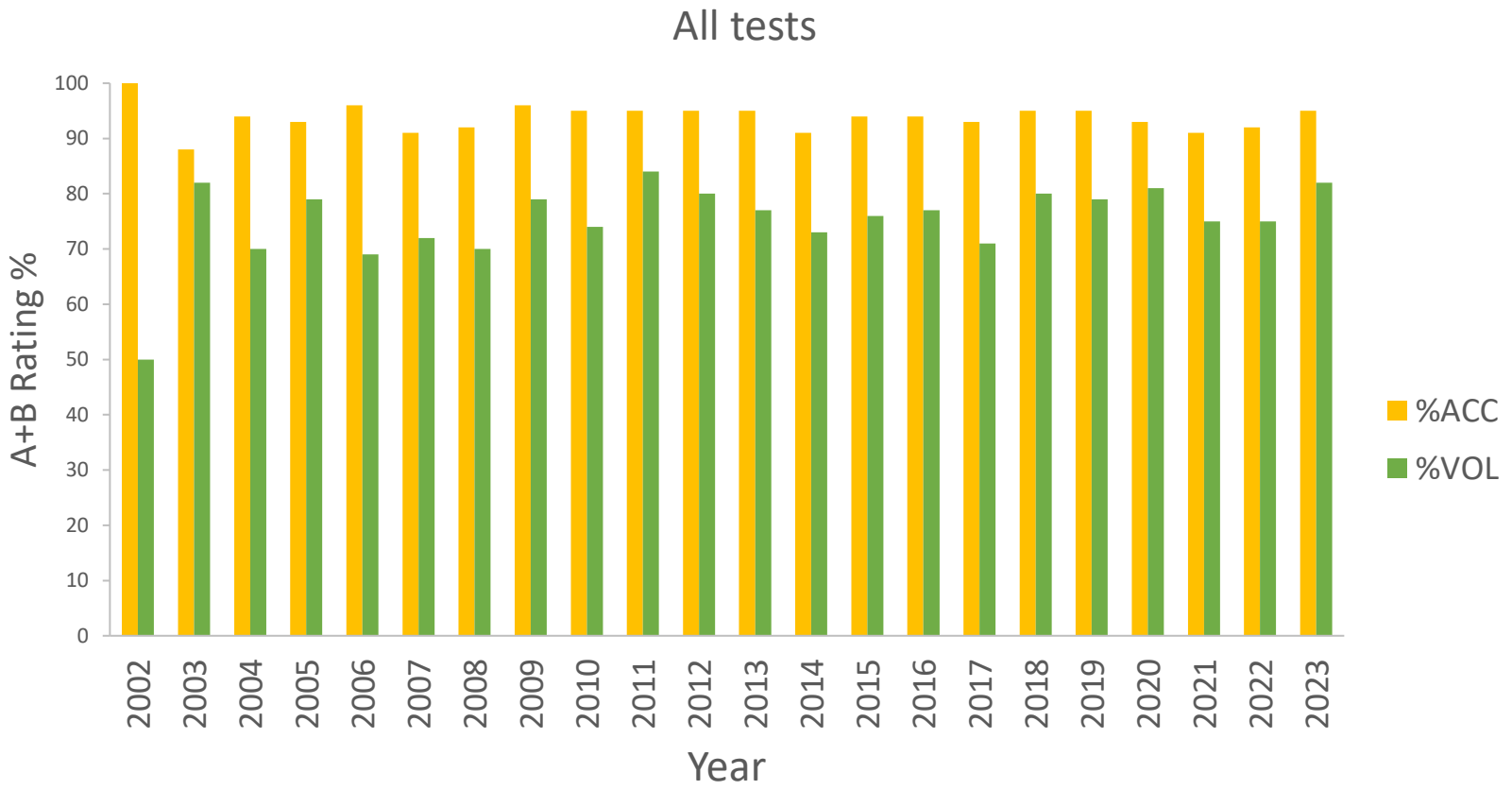
More than 20 years of data in the current database

Growth number of PT participants since 2001

Years	Cereals	Other field crops	Grasses	Pulses	Vegetables	Small legumes	Flowers	Forest
1st PT	**116**	**105**	**92**	**110**	**118**	**114**	**50**	**50**
(2001)	112	110	99	127	117	113	90	52
	108	118	104	134	124	125	105	45
	122	116	114	153	139	137	103	68
	134	123	123	150	157	135	105	**108**
	131	146	127	159	165	151	105	
	131	160	123	145	167	150	**132**	
	147	165	94	166	180	171		
	150	165	123	189	180	**179**		
	167	184	141	180	**189**			
	178	186	138	**173**				
	180	210	154					
	184	178	164					
	193	**195**	**167**					
	207							
2025	**205**							

More than 20 years of data in the current database

A and B ratings trend for accredited and non-accredited laboratories



20 years of data in the current database

OSD – 172 genus added in the samples (1 to 19 times) in 45 PTs

The 14 most added genus:

genus	PTs number	retrieval rate(%)
Trifolium	19	83.6
Bromus	17	88.9
Poa	17	85.6
Rumex	15	92.2
Avena	14	92.3
Echinochloa	13	90.4
Fallopia	12	84.7
Lolium	12	81.7
Medicago	12	78.7
Alopecurus	11	88.2
Festuca	11	57.5
Phleum	11	85.7
Setaria	11	87.1
Sinapis	11	80.2

Best Retrieval rates:
>90% for 35 genus
>95% for 5 genus

genus	PTs number	retrieval rate(%)
Linum	2	96.7
Borago	1	96.3
Convolvulus	3	95.9
Silene	2	95.8
Datura	2	95.0

Worst Retrieval rates:
<50% for 9 genus

genus	PTs number	retrieval rate(%)
Blainvillea	1	9.8
Koeleria	1	13.9
Urochloa	1	21.4
Sisymbrium	1	27.0
Sporobolus	1	29.3
Ammi	1	41.0
Lathyrus	1	47.5
Galega	1	47.8
Astragalus	1	49.9

ISTA ANNUAL MEETING 2024
01-04 JULY
CAMBRIDGE, UNITED KINGDOM

Thank you to
all past and present committee members,
the staff of the ISTA secretariat,
the committees with which we are in contact,
the participants in the PTs, especially those who, by a large majority, never make a claim.