



ISTA
Seed Quality Assurance

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Activity report of the International Seed Testing Association (ISTA) Committees 2020

This yearly Activity Report was prepared by the Technical Committees, the Executive Committee, and the Secretariat of the Association.

The document contains the reports of the Executive Committee, the Technical Committees and of the Secretary General and includes the financial statements of the International Seed Testing Association for 2020, the budget for 2020 and preliminary budget for 2021.

This document is submitted to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organisations for information two months prior to the ISTA Ordinary General Meeting 2021.

The Activity Report was endorsed by the Executive Committee for submission to the ISTA Ordinary General Meeting 2021, to be held virtually on June 03, 2021, for acceptance by the nominated ISTA Designated Members voting on behalf of their respective Governments.

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A. Report of the Executive Committee (ECOM) 2020

1. Composition of the Executive Committee

This report has been prepared by members of the Executive Committee (ECOM), with specific input from Chairs of the ECOM Working Groups (WGs), for the period 1 January 2020 to 31 December 2020. Details from the February 2021 ECOM meeting are not included but will be reported at the 2021 annual ISTA meeting.

The Executive Committee 2020-2021 is composed of:

Officers:

Steve Jones (President)	Canada
Keshavulu Kunusoth (Vice-President)	India

Members-at-large:

Craig McGill (Immediate Past President)	New Zealand
Ignacio Aranciaga	Argentina
Valerie Cockerell	United Kingdom
Sylvie Ducournau	France
Ruel Gesmundo	Philippines
Berta Killermann	Germany
Claid Mujaju	Zimbabwe
Leena Pietilä	Finland
Rita Zecchinelli	Italy

Ex-Officio member: Attilio Lovato (ISTA Honorary President), Italy

This is the second report for the 2019-2022 Executive Committee, elected at the Ordinary General Meeting in July 2019, Hyderabad, India.

The work of the Executive Committee is guided by the 2019-2022 ISTA Strategy reviewed and voted on by the membership at the Hyderabad meeting. Implementation of the strategy is a key goal of the Association and within the Executive Committee implementation is achieved through input from the ECOM working groups. The role of the working groups is to propose solutions on specific topics and where appropriate develop policy for discussion and decision by the Executive Committee. The ISTA President is a member of all the working groups but does not Chair any working groups. The President is the Chair of the ECOM meetings.

The working groups established for the 2019-2022 triennium (working group Chair in brackets) are: Accreditation (Rita Zecchinelli), the Articles and By-Laws of the Association (Keshavulu Kunusoth), International Relations and Designated Authorities (Craig McGill), Events (Berta Killermann), Marketing and Publications (Ignacio Aranciaga), Membership Fees (Keshavulu Kunusoth), Science and Technology Working Group (Leena Pietilä), Technical Committees (Valerie Cockerell), Seed Health (Valerie Cockerell), Vegetable Seeds Industry (Berta Killermann). See sections A.3.1 to A.3.9 for reports from the Working Groups.

In 2020 the International Relations and Designated Authority working groups were merged with Craig McGill as the chair. The joint ISTA-ISF Seed Health Working Group re-established regular meetings between ISF and ISTA members (Valerie Cockerill and Valerie Grimault).

2. Meetings of the Executive Committee

The five-day business meeting of the ECOM was held in February 2020 ECOM in Bologna, Italy and was hosted by Rita Zecchinelli.

Just prior to the meeting, Craig McGill (ISTA Immediate Past President), Keshavulu Kunosoth (ISTA Vice President), Andreas Wais (ISTA Secretary General) and Steve Jones (ISTA President) visited the FAO headquarters (HQ) in Rome, the OECD HQ in Paris and the ISF HQ in Geneva. The aim of the meetings was to continue collaboration and discuss joint initiatives with these key associations that share common goals with ISTA.

The ECOM meeting in Bologna focused on long-term planning, ways to support the work of the Technical Committees, as well as expanding ISTA's marketing efforts, international representation and strengthening the relationship with the ISTA Designated Authorities and other seed sector organisations. In addition, regular business decisions on finances, strategy, ISTA Rules proposals and plans for the Verona OGM meeting were also progressed.

The date and location of the February 2021 and 2022 ECOM meetings were agreed.

After Bologna the COVID-19 situation developed worldwide and ECOM meetings became virtual to allow more regular discussion and decisions for ISTA. The ECOM agreed to make the Ordinary General Meeting (OGM) in Verona, Italy a virtual meeting. Following the emergency Swiss COVID laws ISTA held the OGM voting by email. Although a difficult situation the result was that 48 out of the 53 ISTA Designated voting members eligible to vote for their countries/distinct economies voted on the annual OGM agenda topics and ISTA Rules proposals we had discussed via the virtual meetings. This is largest number of eligible ISTA members voting for many years.

During 2020 the ECOM held monthly 2-hour meetings and along with the ISTA Secretariat used these regular virtual meetings to continue to progress the work of the association, including approving the location move within Switzerland for the ISTA head office. The work of the member ISTA labs was seen to be essential to allow the free movement of seed for planting around the world and the Secretariat and ECOM adapted their work to support the association's members in doing this, including a move to virtual auditing.

It was decided to turn the 2021 annual ECOM business meeting for February 2021 planned for Saskatoon, Canada into five 2-hour virtual sessions concentrating on key decisions needed for 2021.

It was also decided in the interest of safety and on-going travel restrictions linked to the COVID-19 pandemic to make the 2021 OGM planned for Cairo, Egypt into a virtual meeting.

The detailed work of the ECOM within their working groups are reported in section A.3.

3. Activities of the Executive Committee Working Groups

The Executive Committee working groups have worked on the following:

3.1 Accreditation Working Group

Members: Rita Zecchinelli (Chair), Berta Killermann, Valerie Cockerell, Sylvie Ducournau, Florina Palada, Steve Jones.

Activities in 2020

As consolidated over the time, the main task of the ECOM Accreditation Working Group (AWG) is to assist and support the ISTA Accreditation and Technical Department (ATD) in the accreditation related issues.

ISTA auditors

In 2020, the AWG has participated in the selection process of a new system auditor to be employed at the Secretariat. The new System auditor has been selected and will start the work at ISTA Secretariat on 1st March 2021.

Despite the COVID-19 situation, the effort to strengthen the ISTA auditor team continued. Four more candidates to be approved as contracted ISTA auditors are in different steps of the process and one Seed Health expert is newly approved.

Remote audits

2020 was a very special year, due to the COVID-19 pandemic that affected many activities and in particular carrying out onsite audits at laboratories all over the world. Traveling was very difficult at first, then in fact impossible.

The AWG and ATD did their best to adapt to the situation as it evolved. At an early stage, it was decided to reschedule the audits that could not be done, hoping that the situation would make it possible to return to a normal life soon. In fact, some audits were carried out on site in the summer-autumn period of 2020, before the second wave of the epidemic. However, these were mostly in Europe, short-distance audits for auditors.

Long-distance laboratory audits and, in general, all audits scheduled for the final months of the year had to be organized remotely. This decision was proposed by the AWG and ATD to the ECOM to try to recover the backlog. A new procedure on how to perform partially or completely remote ISTA audits was created and implemented.

The experience gained in 2020 in the management of remote audits will be a positive thing coming from this period of difficulty.

The consequences of the difficulties encountered in 2020 also entailed a discussion on the criteria adopted in the timing/scheduling of audits and on the validity of accreditation certificates.

Status of ISTA accreditation

The AWG collaborated as always in the evaluation of specific cases in which the status of an accredited laboratory was questionable due to the PT performance results or other reasons.

Review or strengthening of quality documentation

Reviewing and updating documents is a continuous ongoing process. In 2019 there was an intense discussion within the AWG and ATD aimed at the revision of the ISTA Accreditation Standard for Seed Testing and Seed Sampling and a draft of a new revision was ready to be proposed for approval. The AWG and ATD instead decided in 2020 to postpone the revision in order not to create additional burdens on the laboratories during the pandemic. The current version of the standard has also been translated into German and the translation is ready for publication.

SharePoint is used now to administrate the audit process.

Cooperation with the ISTA Technical Committees

The AWG and ATD often contact the ISTA Technical Committees in order to clarify specific issues arising during audits or for clarifications relating to the ISTA Rules. A particular case is that of the collaboration with the Proficiency Test Committee for the development and improvement of the PT program. In this regard, the collaboration with the Variety Committee must also be remembered because it will lead to the organization in 2021 of a first PT for DNA-based methods.

Challenges

The year 2020 was difficult as already mentioned. In addition to the strong impact on the audit programme, other initiatives have been temporarily frozen. This is the case of the review of the accreditation standard, but also of other ongoing studies, such as the one relating to the audit organization for multi-sided laboratories and the study about the audit structure (definition of "categories" of laboratories, based on the scope of accreditation in the aim to differentiate the duration and cost of the audit).

Special projects

The interactive learning tool on how to complete ISTA Certificates was finalised and is available on the ISTA website; the related procedure was revised with the support of the Rules Committee.

The Crop groups table from the application for accreditation was approved by the ECOM.

A seed mixture sample was prepared with the aim to train the ISTA accredited laboratories in *Cuscuta* spp. seed identification.

The first Quality Assurance on-line Workshop was prepared with the support of the ECOM Training sub-working group.

Two new platforms are being used: GoToMeeting for the remote audits and GoToTraining for the on-line Quality Assurance Workshops.

3.2 The Articles and By-Laws of the Association Working Group

Members: Keshavulu Kunusoth (Chair), Craig McGill, Andreas Wais, Steve Jones.

The ISTA Articles Working Group did not progress any Articles change proposals for voting on at the 2020 virtual meeting.

Articles change proposals were worked on in 2020 in preparation for distribution to the membership ready for voting on at the 2021 meeting.

3.3 International Relations and Designated Authorities Working Group

Members: Craig McGill (Chair), Keshavulu Kunusoth, Claid Mujaju, Ruel Gesmundo, Sylvie Ducournau, Olga Stöckli, Andreas Wais, Steve Jones.

For the 2019-2022 Triennium the Executive Committee established two working groups. A working group for the ISTA Designated Authorities and a working group on International Relations. As both these working groups are externally focussed the Executive Committee decided at the Executive Committee Meeting in Bologna to merge these two groups into a single working group, the International Relations and Designated Authorities Working Group.

The focus of the working group is on strengthening interaction between ISTA, its Designated Authorities and other international organisations. Specifically, the International Relations and Designated Authorities Working Group International Relations Working Group develops the international relations policy for discussion and approval by the Executive Committee, coordinates the representation of ISTA in international fora and meetings with ISTA's Designated Authorities in particular during Annual Meetings and Congresses. In addition, the Secretary General meets with the Designated Authorities individually when visiting countries which have an ISTA Designated Authority. As a result of the COVID-19 pandemic international travel including visits by the Secretary General with individual Designated Authorities has not been possible. Similarly, attendance at international fora have been largely online for most of 2020.

As a result of the 2020 ISTA Annual Meeting in Verona becoming a much shorter virtual meeting the Designated Authorities meeting planned during the Annual Meeting did not take place. The ISTA Designated Authorities were contacted advising them of the cancellation of the physical Annual Meeting and its replacement with a virtual meeting. The Designated Authorities were also asked if they have not already done so to nominate a Designated Voting member for the Ordinary General Meeting and for feedback on any needs from ISTA.

The many international organisations ISTA's interacts with fall into five groups:

1. Regulatory organisations including at the national level, the Designated Authorities (DA) of member countries and international organisations such as OECD, FAO, UPOV and IPPC. ISTA has regular contact with FAO and OECD. ISTA participates at OECD Meetings as observer organisation on a regular basis and in 2020 also met with OECD at its headquarters in Paris, France. Since 2019 ISTA has had observer status at IPPC. Face-to-face meetings were also held between FAO, IPPC and ISTA in February 2020 in Rome, Italy.
2. Organisations related to the accreditation work of ISTA such as the International Laboratory Accreditation Cooperation (ILAC). As an ILAC stakeholder, ISTA participates in the annual meetings organised by ILAC. In 2020 the meeting was held virtually. ISTA is continuing to publish information on ISTA activities in ILAC's news bulletin.
3. Scientific fora and collaboration with other associations such as ISSS (International Seed Science Society).
4. Technical collaboration with other organisations to harmonise seed testing methods worldwide such as AOSA/SCST in the United States, and ABRATES in Brazil. ISTA also works with ISHI through ISF.
5. Collaboration and exchange of information with the seed trade and seed industry. At the international level this is ISF and at the regional level it is with organisations such as AFSTA, APSA, ASTA and ESA. A physical meeting with ISF was held in February 2020 in Nyon, Switzerland. In 2020 ISTA signed a Memorandum of Understanding with APSA. ISTA is also continuing collaboration at the regional level with the Seed Association of the Americas (SAA).

In addition to the five groups there is the World Seed Partnership, a collaboration between ISF, ISTA, OECD, UPOV and WFO. This is a platform for promoting and distributing key information on seeds and the role of each organisation in the partnership within the seed sector. The aim of the World Seed Partnership is the improvement of security of seed supply nationally and regionally. Projects in Nigeria, Myanmar and Mongolia are on hold caused by the COVID-19 pandemic.

As noted in 2020 physical meetings were only possible with OECD, FAO, IPPC and ISF; all held in February 2020.

3.4 Events Working Group

Members: Berta Killermann (Chair), Rita Zecchinelli, Keshavulu Kunusoth, Craig McGill, Olga Stöckli, Andreas Wais, Steve Jones.

The Events Working Group develops the events policy for the Association for discussion and approval by the Executive Committee and supports the Secretariat in the organisation of ISTA events, in particular Annual Meetings and Congresses.

In 2020 the working group was involved in the organisation of:

- The ISTA Annual Meeting 2020 in Verona, Italy.
- The ISTA Annual Meeting 2021 in Cairo, Egypt including the elaboration of a common programme and the Plant Health Seminar.
- The 33rd ISTA Congress 2022 in Christchurch, New Zealand, including the elaboration of a common programme, the scientific seed symposium programme and the presentation of the Technical Committee work.

3.5 Marketing and Publication Working Group

Members: Ignacio Aranciaga (Chair), Berta Killermann, Andreas Wais, Olga Stöckli, Yoana Uzunova, Karen de la Rosa and Sven Molenaar, Steve Jones.

The Marketing and Publication Working Group aims to develop the marketing and publication policy in the Association for discussion and approval by the Executive Committee. It also supports and assists the Secretariat with marketing initiatives.

In 2020 a diverse range of digital marketing initiatives were undertaken using social media including LinkedIn, YouTube, Twitter as well as the ISTA website and newsletter. The LinkedIn and Twitter activities have continued with regular posts. The Newsletter is sent once a week. On Twitter ISTA has more than 1200 and on LinkedIn over 7100 followers with an increased level of engagement. In December 2020 there were about 580 subscribers to the YouTube channel.

The ISTA President and Secretary General participated in the First Argentinean Seed Congress (Web Congress) with two videos expressing the ISTA objective to grow in different parts of the world. Ignacio Aranciaga (ECOM Member at Large) together with others Argentinean colleagues that work in different ISTA TCOMs, made a presentation about ISTA and the work in the TCOM that they belong. The objective was to encourage other colleagues from the region to participate in ISTA.

In 2020 a Webinar series for information of the membership was started with an interview of the ISTA President, Steve Jones by the Secretary General on the topic of ISTA during the COVID-19 pandemic. This podcast was made available on the ISTA YouTube Channel. In 2021 this series will be continued.

At the same time the Marketing and Publication Working Group has worked with the Rules Committee to ensure the 2020 International Rules for Seed Testing is in 4 languages (English, French, German and Spanish). With the aim to promote the use of the ISTA Rules and to attract more people to participate in ISTA, during the months of January and February, the single chapters of the ISTA Rules had a 50% discount.

Finally, it is important to mention that the implementation of the weekly newsletter gave the possibility to increase the contact with the members and with other organizations/colleagues around the world and permit to more regular information on several topics for the Association.

3.6 Science and Technology Working Group

Members:

ECOM members of the working group: Leena Pietilä (Chair), Valerie Cockerell, Sylvie Ducournau, Craig McGill, Andreas Wais, Steve Jones.

Technical Committee members: Bert Van Duijn (Advanced Technology), David Johnston (Germination), Ruoqing Wang (Purity) and Ernest Allen (Rules).

The purpose of the Science and Technology Working Group is to develop policy and oversee science and technology within the Association. The aim is based in ISTA strategy Goal 4: Strengthen the Science and Technology underpinning ISTA, to develop innovative research to make the link between scientific developments and applications in seed sampling and testing, and to allow the requirements of the seed sector to be met.

The ECOM group had meetings on the role of ISTA with biostimulants. The question was also discussed within the Seed Science Advisory Group.

3.7 Technical Committee Working Group

Members: Valerie Cockerell (Chair), Craig McGill, Leena Pietilä, Ruel Gesmundo, Claid Mujaju, Nadine Ettel, Andreea Militaru, Andreas Wais, Steve Jones.

The Technical Committee Working Group develops Technical Committee policy for discussion and approval by the Executive Committee. This group is also responsible for initial evaluation of applications for the 100 000 CHF special project fund and providing a recommendation to the ECOM on a decision.

In 2020 the group met on five occasions. Work included evaluation of the two proposals received as a result of the 2019 call for special projects, both proposals were approved by the ECOM for funding. The two projects are:

1. Exploration of methods for detecting insects. Submitted by: Seed Health Committee & Advanced Technology Committee.
2. The development of digital reference matrixes for the ISTA Universal List. Submitted by: Purity Committee.

Both projects will provide benefits to the membership through improved digital references for seed identification and training, and examining the potential role of ISTA for insect identification in relation to seeds.

A meeting was held with TCOM Chairs in July 2020 principally to discuss the progress of the sub-working group on Training and to explore why only a few TCOMs have submitted 100 000 CHF special project funding applications. Other topics were raised and work is on-going to find solutions to support TCOM Chairs across all topics discussed.

Training sub-working group

Members: Craig McGill (Chair), Valerie Cockerell, Ruel Gesmundo, Keshavulu Kunusoth, Claid Mujaju, Florina Palada, Leena Pietilä; Andreea Militaru, Andreas Wais, Steve Jones.

The second goal of the ISTA Strategy is to “contribute and develop collaborations to increase seed testing capacity and capability worldwide”. Online training and “train the trainer” have been acknowledged as important mechanisms for expanding ISTA’s current training programmes beyond physical workshops. COVID-19 has provided added impetus to this approach.

The training sub-working group (chaired by Craig McGill) established at the February 2020 Executive Committee meeting has been investigating options for expanding ISTA’s training. The work of the sub-training group has been discussed with the ISTA Technical Committee Chairs. The sub-working group has made a series of recommendations to the Executive Committee including that:

1. online training should not replace physical workshops. Physical workshops will remain the primary training mechanism for ISTA. This proposal also came from the ISTA Technical Committee Chairs.
2. online training is likely to be more an introduction to a topic or be focussed on a specific topic area rather than a range of topics as in physical workshops.

3. a pilot online training workshop be developed and the first online workshop will be on Quality Assurance. This will be followed by a second pilot on a topic that includes practical training. Preparations for the Quality Assurance workshop are being led by Florina Palada from the Accreditation and Technical Department and is expected to be held in April 2021 after a trial in February 2021.
4. the concept of “train the trainer” and what it means for ISTA will be discussed in the Executive Committee.
5. the fee structure for on-line training relative to physical workshops will be discussed in the Executive Committee.

3.8 Membership Fees Working Group

Members: Keshavulu Kunusoth (Chair), Craig McGill, Rita Zecchinelli, Valerie Cockerell, Andreas Wais, Steve Jones.

The aim of the Working Group on Membership Fees is to review and propose changes to the ISTA membership fees for laboratories, sampling entities, the additional fee for an accredited laboratory, personal and associate members.

In 2020 no changes to the membership fees were amended and the 10% discount for payments completed before 31 December 2020 were maintained.

3.9 Young@ISTA Working Group

Members: Keshavulu Kunusoth (Chair), Craig McGill, Berta Killermann, Sylvie Ducournau, Andreas Wais, Steve Jones.

The young @ ISTA working group was established as a result of a meeting with young seed professionals held during the 2019 ISTA Congress in Hyderabad. The aim of this working group is to develop the idea of Young@ISTA as a means of attracting young seed professionals into the association. This will enable a younger generation to become involved in ISTA and continue the activities of ISTA into the future; empower seed professionals to lead innovative solutions in seed science and testing and also facilitate an ongoing contribution of seed professionals within ISTA.

The aim is based on action 3 of the fourth goal of the 2019-2022 ISTA Strategy (action: to Build science capability through attracting more scientists and researchers into ISTA work either directly or through collaboration). To achieve this goal there is a need, as a first step, to attract talented professionals /researchers /analysts /scientists who are willing and able to contribute to the work of ISTA for the benefit of their home country, organisation, and personal career development.

The working group developed terms of reference for Young@ISTA including aims, definitions for eligibility criteria to define Young@ISTA and also the strategy for attracting a new generation of seed professionals to ISTA and a process to implement the strategy. The working group discussed the proposed strategy with the ISTA Technical Committee Chairs. This is because it will be through the Technical Committees that many young seed professionals will come into the work of ISTA. The working group also met with the young seed professionals who attended the meeting in Hyderabad to have their input on the terms of reference and the ways that Young@ISTA can attract young seed professionals. As a result of this meeting the terms of reference have been confirmed. The working group is now working on one of the promotion strategies. This is to develop a young@ISTA online forum to enable regular interaction on seed science, testing, and technologies. This online forum will also enable young seed professionals beyond the group who met in Hyderabad to join and contribute to Young@ISTA.

3.10 ISTA – ISF Seed Health Working Group

Members: Valerie Cockerell (Chair), Valerie Grimault, Rose Souza Richards, Radha Ranganathan.

The purpose of this working group is to provide a forum to discuss seed health related topics that concern both organisations and explore synergies to be had in combining forces. Three meetings were held in 2020 discussion centred on understanding both the intention and method for both the ISF and ISTA pest lists. Further discussion on potential collaboration for both the pest lists and method validation will be continued in 2021.

3.11 Vegetable Seed Industry Working Group

Members: Berta Killermann (Chair), Merel Langens (Vice-Chair).

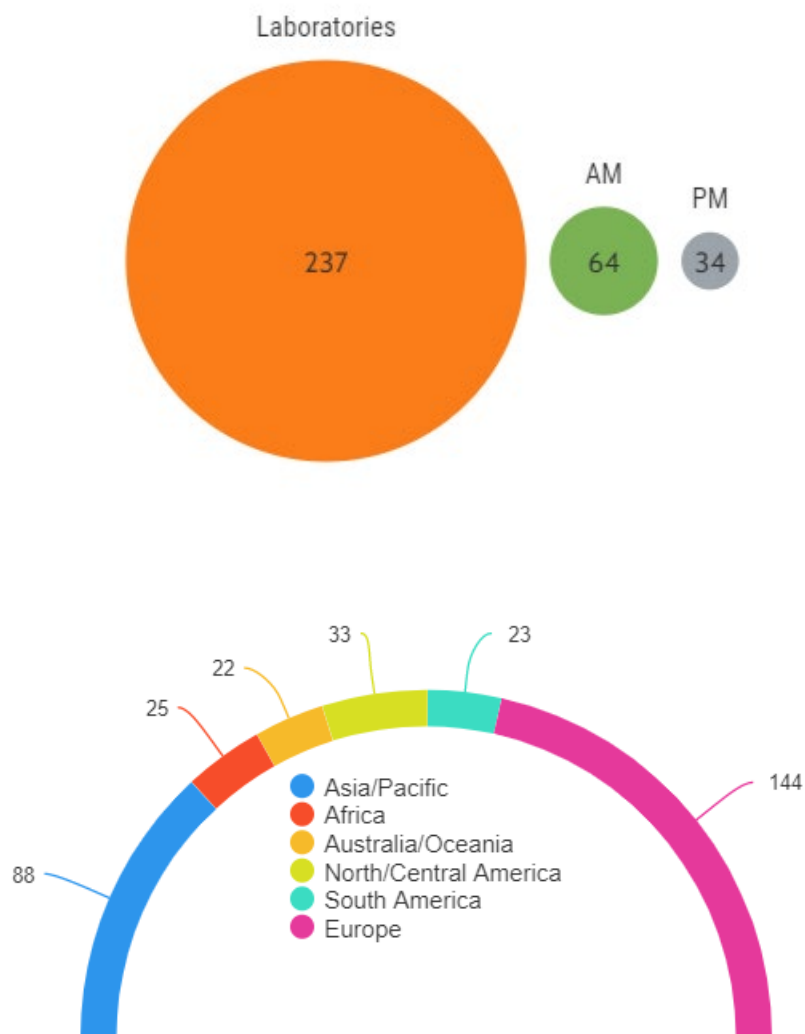
The Vegetable Seed Industry Working Group has members from the Seed Industry, ECOM, Technical Committees and ISTA Secretariat. In 2020 the Working Group met via conference calls. The discussions are on-going to organise an experiment together with the vegetable seed industry to increase the number of sub-lots of vegetable seeds. The possibility to reduce the weight of the working sample for the other seed determination for fruity crops is also under consideration.

B. Reports of the Secretary General, Proficiency Test Committee, Rules Committee, Editorial Board and Seed Science Advisory Group

1. ISTA Membership

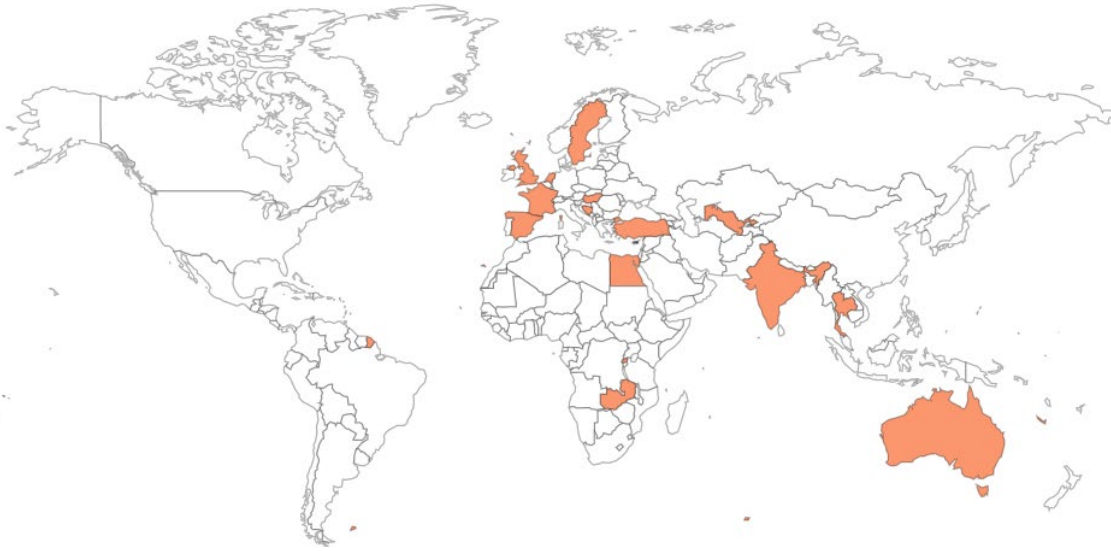


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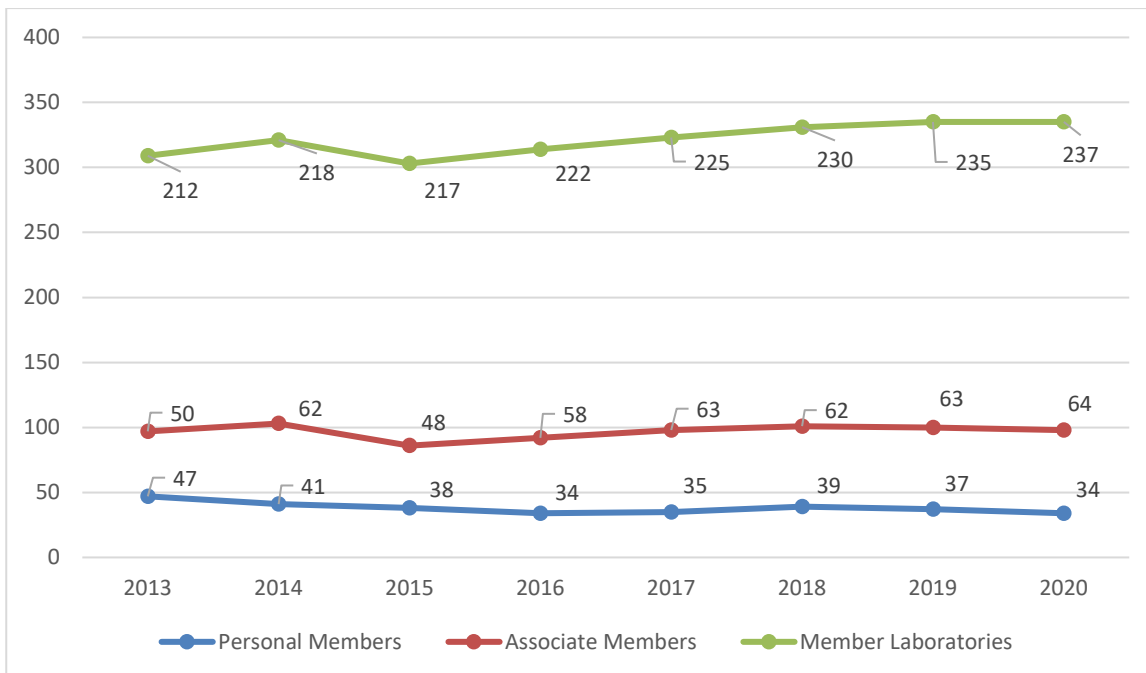




New ISTA Members 2020



ISTA Members 2013 – 2020





Honorary Members

According to section III., Article 4 (h) of the Articles of the ISTA:

“An Honorary Life Member is a person who in the opinion of the Association has made an outstanding contribution to the Association, and has been honoured by election to the status.”

The elected Honorary Life Members as of 2020 are:

Joël Léchappe (2019)

Grethe Tarp (2016)

Alison A. Powell (2013)

Ronald Don (2008)

Norbert Leist (2007)

Furthermore, Attilio Lovato was elected Honorary President at the Congress 2001.

2. Activity Report of the Rules Committee June 2020 to December 2020

The ISTA Rules Committee is composed of the Honorary President, all the Chairpersons of the Technical Committees (TCOMs), the Chief Editor of SST, the AOSA Rules Committee Chair and the SCST Co-Chair. As part of joint initiatives with AOSA, the AOSA/SCST Rules Chairs are *ex officio* members of the ISTA Rules Committee and the ISTA Rules Chair is an *ex officio* member of the AOSA Rules Committee. The Chair and Vice-Chair of the ISTA Rules Committee are appointed by the ISTA Executive Committee (ECOM).

The following is a list of the current ISTA Rules Committee members:

Chair:	Ernest Allen	United States
Vice-Chair:	Susan Alvarez	United States
Observer:	Florina Palada	

ECOM liaison officer: Ignacio Aranciaga

Members:	Ruojing Wang (PUR)	Canada
	Didier Demilly (PTC)	France
	Gillian Musgrove (GER)	United Kingdom
	Eddie Goldschagg (BSC)	South Africa
	Elisa Vieira (FTS)	Brazil
	Valerie Grimault (SHC)	France
	Fiona Hay (EDI)	Denmark
	Stefanie Krämer (TEZ)	Germany
	Jean-Louis Laffont (STA)	France
	Enrico Noli (GMO)	Italy
	Axel Goeritz (MOI)	Germany
	Alison A. Powell (VIG)	United Kingdom
	Jayanthi Nadarajan (STO)	New Zealand

	Bert van Duijn (ATC)	Netherlands
	Ana Laura Vicario (VAR)	Argentina
	Melanie Schori (NOM)	United States
	Rita Zecchinelli (FSC)	Italy
	Gil Waibel (WSWG)	United States
<i>Ex-officio:</i>	Randy Crawl (AOSA)	United States
	Desirae Jones (SCST)	United States
	Attilio Lovato (Honorary President)	Italy

Activities

The ISTA Rules Committee is responsible for reviewing the annual Rules proposals and ensuring that the proposals are technically consistent between the different chapters. Rules proposals can come from anyone but are usually made by one of the TCOMs or by the ISTA Accreditation Department. The procedures for submitting proposals and adding new species and methods to the ISTA Rules are outlined in the Introduction to the Rules. The Rules Chair is responsible for editing the Rules and presenting the proposals for amending and voting at the Ordinary Meeting on behalf of the ECOM and the Rules Committee.

The Rules Committee is assisted by staff at the ISTA Secretariat, who collate the Rules proposals and validation studies and then coordinate the translation and the production of the revised Rules. Following the results of the voting at the annual meeting, the amended Rules are edited, translated and distributed to the membership.

The revised electronic version of the 2021 ISTA Rules was made available to the membership for download on 1st December 2020. This was made possible by the dedicated teamwork of the Rules Committee, the TCOMs and the ECOM, and the ISTA Secretariat, starting with the coordination of the proposals by Nadine Ettel and Andreea Militaru, the preparation of the translation into Spanish, French, and German by the translators in Argentina, France and Germany as coordinated by Ignacio Aranciaga, Clotilde Polderman-Roussille and Elke Nitschke, and final publishing by Karen De La Rosa, the proofreading and setting everything up in In-Design by Vanessa Sutcliffe of HeartWood Editorial, and the distribution to the membership by Agnes Hegedus.

The effective date for the 2021 ISTA Rules is 1st January 2021. For details on how to download the electronic version, see the Publications section of the ISTA website. While the ISTA Rules are available in French, German, and Spanish, the official reference version of the ISTA Rules is the English version.

Sales of online ISTA Rules for 2018-2020							
Item		2018		2019		2020	
		Sold	Income (CHF)	Sold	Income (CHF)	Sold	Income (CHF)
Royalties from direct download sales (remitted in USD)	Full Rules issues	43	CHF 19'297.00	37	CHF 16'000.00	35	CHF 14'426.00
	Single chapters	45	CHF 3'794.00	57	CHF 4'800.00	57	CHF 3'465.00
Sales via Secretariat (CHF)	Multiple-user access (e.g. non-member labs)	12	CHF 16'660.00	16	CHF 22'400.00	14	CHF 19'600.00

	Single-user access (Associate Members)	24	CHF 5'607.69	32	CHF 7'360.00	39	CHF 9'446.24
Total		124	CHF 45'358.69	142	CHF 50'560.00	145	CHF 46'937.24

Overview of Rules change proposals approved in May 2020

Changes to the 2021 Edition of the ISTA Rules approved at the Ordinary General Meeting in May 2020 can be found on the ISTA website at:

https://www.seedtest.org/upload/cms/user/RulesProposalsforISTA2021EditionV11_FINALVOTES.pdf

The supporting validation reports are also available at:

<https://www.seedtest.org/upload/cms/user/OGM20-06ISTAMethodValidationReports1.pdf>

List of approved changes:

Introduction

I-1: Health and Safety statement added. Statement reviewed and approved by ECOM and Rules Committee.

Chapter 1

1.5.2.2: Result of changes approved in Chapter 2 during OGM16.

1.5.2.2: Clarification that authorities are not required for reporting.

1.5.2.6: Result of proposal submitted to Germination Committee by ISTA Accreditation Department. Clarity in section 5.9 that only percentage germination is reported when germination test is terminated due to predetermined germination level.

1.5.2.17.2, 1.5.2.17.3 and 1.5.2.17.4: Reference for 5.8.2 replaces the current erroneous reference of 5.8.1.

1.5.2.21, 1.5.2.21.2 and 1.5.2.21.3: Result of changes approved in Chapter 19 during OGM18.

Chapter 2

2.8: Result of nomenclature changes to the ISTA List of Stabilised Plant Names that have been incorporated into Table 2C. Previous cross references were not removed prior to the printing of the 2020 Rules. Previous cross references will be removed in the 2021 Rules and the last sentence of the current version will be replaced.

Table 2C Part 1: Result of approved nomenclature changes to the ISTA List of Stabilised Plant Names.

Chapter 3

3.7: Result of changes approved in Chapter 2 during OGM16.

3.7: Clarification that authorities are not required for reporting.

Table 3A: Deletion of *Poa pratensis* varieties that are no longer being traded. Proposal approved by majority vote in Purity Committee.

Chapter 4

4.2.1: Result of changes approved in Chapter 4 during OGM18.

4.2.2: 'Orobanchaceae' replaced with 'dust-like seeds' to harmonise with other changes related to such seeds. Addition of 'indistinguishable species' to distinguish those seeds that are costly to or not reliably retrieved in the complete test quantity. Proposal approved by majority vote in Purity Committee.

4.2.4: 'Orobanchaceae' replaced with 'dust-like seeds' and 'very expensive seed' replaced with 'small seed lots' to harmonise with other changes related to such seeds. A reduced test is allowed in the Rules for similar species searches. Proposal approved by majority vote in Purity Committee.

Chapter 5

5.2.7.2: Result of validation study carried out in Germination Committee to change evaluation of roots for *Helianthus annuus*, allowing for secondary roots when the primary root is defective. Proposal approved by Germination Committee.

5.6.2.4 and 5.6.3.1: Clarity that LED lights can be used for germination. Proposal supported by Germination Committee.

5.9: Proposal submitted to Germination Committee by ISTA Accreditation Department. Clarity that only percentage germination is reported when germination test is terminated due to predetermined germination level.

Table 5A Part 1: Result of validation study conducted on *Brassica napus* to determine which temperature requirements for germination promoted higher normal seedling development and enhanced testing reproducibility among labs. Proposal supported by Germination Committee.

Chapter 7

Method 7-001a, -001b, -002a, -002b, -003 -005, -006, -008, -010, -011, -012, -013a, -013b, -014, -015 and -016: Increasing harmonisation for sample and subsample size throughout Seed Health Methods. Proposal approved and supported by Seed Health Committee.

Methods 7-001a, -001b, -002a, -002b, -007 and -009: Clarifying instructions for preparing hypochlorite solutions for pretreatment as prescribed in Methods.

Method 7-004, -007, -019a, -019b, -020, -021, -022, -023, -024, -025, -026, -027, -028, -029, -030, -031 and -032: Increasing harmonisation for sample size with other methods to detect fungi. Proposal approved and supported by Seed Health Committee.

Methods 7-005, -006, -008, -014, -016, -022 and -032: Clarifying instructions for preparing hypochlorite solutions for pretreatment as prescribed in Methods. Adding use of hypochlorite solutions for methods Changes to the ISTA Rules for 2021 similar to those already approved in Rules. Proposal supported by Seed Health Committee.

Method 7-007: Revision requested by Seed Health Committee to make description of *Alternaria linicola* more informative.

Method 7-019a, -019b and -020: Addition of safety considerations when using ethidium bromide. Proposal supported by Seed Health Committee.

Method 7-019a and -020: Clarity that alternative chemicals other than ethidium bromide may be used for this method. Proposal supported by Seed Health Committee.

Method 7-021, -030 and -031: Clarity that alternative chemicals other than ethidium bromide may be used for this method. Addition of safety considerations when using ethidium bromide. Proposal supported by Seed Health Committee.

Chapter 9

9.2.4.2, 9.2.5.4, 9.2.5.6, 9.3.1.4, 9.3.1.5.1, 9.3.1.5.2, 9.3.1.5.3, 9.3.1.5.4, 9.3.1.5.5, 9.3.2.4.3, 9.3.2.8 and 9.3.2.9: Review of Chapter 9 with recommendation that some wording changed to improve clarity on when a laboratory must perform an action and when it is suggested that the laboratory should perform the action (but would not be found in violation during an ISTA audit if they used a different but acceptable alternative process). Proposal approved by Moisture Committee.

9.2.4.3: Clarification of definition of appropriate containers for use in oven moisture testing. Review of Chapter 9 by Moisture Committee.

9.2.4.6 and 9.2.5.4: Use of singular 'mesh' instead of misleading 'meshes'. Proposal approved by Moisture Committee.

9.2.5.2: Section re-ordered and modified to improve clarity and to avoid confusion about differences in how many working samples are drawn depending on whether seeds are whole or ground.

Table 9A Part 2: Moisture method for *Carica papaya* included in table. Proposal made following validation studies carried out within Moisture Committee.

Chapter 15

15.8.2.8, 15.8.3.6 and 15.8.4.6: Reference for 5.8.2 replaces the current erroneous reference of 5.8.1.

Table 15B: Clarification of assessment of 2 mm radicle; consistency in description of germination media for radicle emergence test for *Zea mays* and *Triticum aestivum* subsp. *aestivum*; all Latin names expressed according to ISTA List of Stabilised Plant Names. Additional text clarifies measurement of 2mm in radicle emergence test for these species and specifies that assessments should be made by eye. All validation for radicle emergence has been done without magnification and has achieved repeatability and reproducibility. Proposal supported by Vigour Committee.

3. Accreditation Programme

Report of the Proficiency Test Committee and standard PT coordinator

This is an overview of the standard proficiency test program; the activity related to the seed health proficiency test and to the GMO Proficiency Test is presented under the related Committee chapters.

3.1 Proficiency tests 2020 preparation and dispatch

In 2020, three standard proficiency test rounds (PT) were prepared by PT Leaders and dispatched to laboratories from the ISTA Secretariat, according to the 2020–2022 Programme Plan (see Table B.3.1).

Table B.3.1. List of species and test types for 2020

Round	Species	Test round scope	Test leader	Sample number	Number of participants
20-1	<i>Phaseolus vulgaris</i>	G, M, V (conductivity test)	Gillian McLaren	3x210	182
20-2	<i>Allium porrum</i>	P, OSD, G, TSW*	Irena Gera	3x210	180
20-3	<i>Festuca pratensis</i>	P, OSD, G, OIC	Susanne Andersen	3x205	170
	MIX for training	Purity Committee		180	
20-3	<i>Felicia sp.</i>	G	Zita Ripka	3x155	119

P - purity, OSD - other seeds determination, G - germination, M - moisture determination, TZ - tetrazolium test, V - vigor, OIC - reporting on an ISTA Certificate, MIX - mixture of other seeds for seed identification, TSW* – Thousand seed weight test (1st round)

Shipping the PT19-3 on *Hordeum vulgare* was delayed from 2019 for the beginning of 2020. The statistical analysis and reports for the PT round 19-3 *Hordeum vulgare* has been finalised and published in August 2020. This round also included the seed mixture exercise organized by the ISTA Purity Committee, which is not subjected to the rating system.

Thousand Seed Weight Test is newly introduced in the PT Program and this very first round has the training aim. Participants received the ratings, as an informative result, based on which the committee will decide on the future possible use of the test.

In 2020, first two PT rounds needed to be postponed both in samples distribution to the participants as well as in receiving the test results from participants. However, the final PT round samples could be distributed according to the standard schedule, before 1 December 2020.

3.2 Reporting of Proficiency test results

In 2020, four PT leaders prepared 2'340 samples, performed 36 heterogeneity tests, and added 15'530 seeds in the samples for OSD test. Also 180 mixture seed sample were prepared by the Purity Committee for training purposes. Statistical analysis was done on PT results, and individual reports sent by the ISTA Secretariat to laboratories (648 preliminary and final reports). Summary reports are available on ISTA website: https://www.seedtest.org/en/proficiency-test-rounds-_content---1--3461--1193.html

Complementary information and analysis have been prepared for the annual meeting in June 2020 and it is published in the STI number 160, October 2020 issue (<https://issues.ink/ista/160-october-2020/?page=24>).

The following diagrams represent the trend in performance of accredited laboratories versus non-accredited for the year 2020. It is noticeable that voluntary participants have a less A and B rating and more C and BMP ratings in comparison with accredited laboratories.

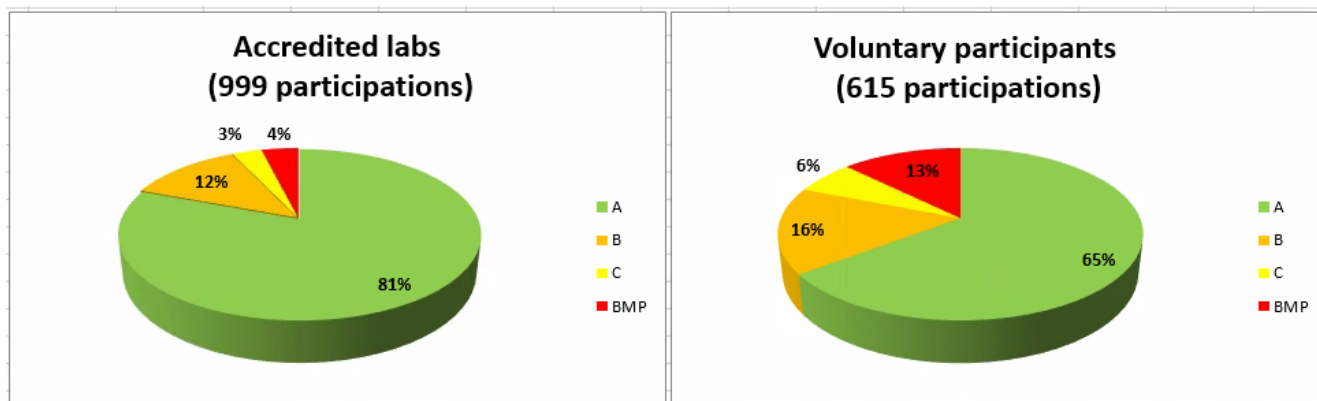


Figure 1: Laboratories rating for the year 2020 for all tests and all participations. Comparison between accredited and voluntary participating laboratories.

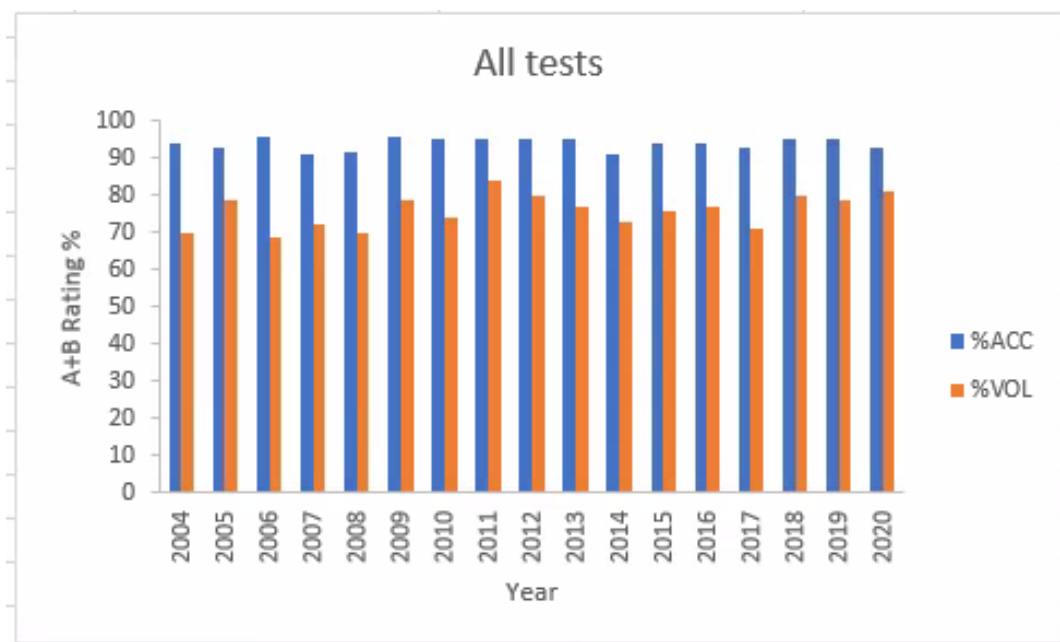


Figure 2: A and B ratings trend for accredited and non-accredited laboratories

The **figure 2** shows that rating A and B is always higher for accredited compare to volunteers' laboratories. The percentage of A and B ratings for accredited laboratories since 2004 is quite stable and always higher than 90%. This shows the high proficiency of accredited laboratories. This gives confidence in the test results of accredited laboratories.

3.3 Goals and objectives

The main goal of PT Committee and PT Coordinator is to prepare and distribute the PT samples to participants in good time and good condition, as well as to timely analyze the laboratories test results. The program contributes strongly to the uniformity and to the proficiency in seed testing. It also serves as monitoring tool for the performance of ISTA accredited laboratories.

The objective is to fulfill new phytosanitary requirements like the new European Union regulation which is in force since December 2019. An article explaining the new constraints is under validation by the swiss officials and will be publish in the next STI issue.

For the shipments outside of the European Union, certain percentage of the PT samples are very difficult to deliver and sometimes even impossible, due to the local custom restrictions. We will continue our effort to remove these obstacles. In this regard a new version of the PT round preparation procedure has been created (ISTA confidential document) focusing on seed lot selection and traceability formalization.

For 2021 program, first two PT rounds are already under preparation. The PT Committee will maintain the objective to fulfil the complete 2021 plan, however the PT round on forest seeds (*Ulmus* sp.) will be moved later

in the year and the originally indicates species will be replaced with more suitable species (as tetrazolium test has not been introduced in ISTA Rules for *Ulmus* sp.).

The PT Committee Chair and PT Coordinator will continue supporting PT Leaders in the preparation of the assigned PT rounds, especially the newly accepted PT Committee members. There were two new Committee members accepted this year and one new Committee member accepted for 2021.

Pernilla Andersson has changed her jobs and left the committee. We wish her all the best at her new work, and we thank her for her participation in the Committee. Pernilla was assigned for organization of the PT 22-2 *Spinacia oleracea* round, which is now transferred to Sharon Davidson. We thank Sharon for taking over this round.

We would also like to thank Mrs. Dot Vittrup Pedersen and DLF Denmark, for providing seeds for the organisation of the *Festuca pratensis* PT round.

3.4 Audit programme

In March 2020 was planned an auditors Meeting in Poznan, Poland.

Due to the restrictions imposed by the Covid - 19 pandemic, the meeting was postponed for 2021.

3.5 Accreditation under the Performance- Based Approach

By the end of 2020, a number of 13 laboratories were accredited under the principles of the Performance-Based Approach:

Table B.3.16 Laboratories accredited under the principles of Performance-Based Approach

Country/Distinct economy	ISTA laboratory code
ARGENTINA	AR01
AUSTRIA	AT03
DENMARK	DK08
FRANCE	FR03
GERMANY	DE04
HUNGARY	HU01
ITALY	IT01 and IT03
JAPAN	JP03 and JP07
SERBIA	RS02
URUGUAY	UY02
UNITED STATES OF AMERICA	US11

3.5 Accreditation administration

The ISTA Accreditation and Technical Department has organised one Quality Assurance Workshops:

ISTA Workshop on Quality Assurance and ISTA Accreditation for Beginners in Tunisia, in French language

The workshop was planned for April, to be hosted in Tunis in collaboration with the African Seed Trade Association (AFSTA). The lecturers preparing the Workshop were Dr. Florina Palada, Head of Accreditation and Technical Department, ISTA Secretariat, Dr. Joël Léchappé, ISTA Technical Auditor and ISTA Honorary Life Member.

Due to the restrictions imposed by the Covid - 19 pandemic, the Workshop was postponed for 2021.

The ISTA Secretary General and the Head of the Accreditation and Technical Department worked together with the ECOM sub-working group on training to develop an online Quality Assurance training workshop for beginners as a test case to identify the needs, including resources, and limitations for online training.

3.6 Document updates

The following is a list of ISTA accreditation documents relevant for member laboratories, were created or updated in 2020:

- Acc-P-10-Partially or complete remote audit, due to Covid-19 pandemic – new created
- Acc-F-09 Application Form for (Re)Accreditation - updated
- The Executive Committee (ECOM) Accreditation Working Group (AWG) formed by Steve Jones (ISTA President), Rita Zecchinelli (Chair), Berta Killermann, Valerie Cockerell, Sylvie Ducournau, Andreas Wais and Florina Palada, has worked to revise and improve the table of crop groups that serves as a reference in the framework of ISTA accreditation. The crop groups represent an important criterion for defining the scope of accreditation for laboratories.

The revision required the following activities:

- Table 2C Parts 1, 2 and 3 of the ISTA Rules were carefully checked versus the crop groups table.
- A few missing species were added in the crop groups table (the Bulking and Sampling, Purity, Germination and the Forest Tree and Shrub Seed TCOM chairs were consulted).
- The scientific names of the genera were aligned to the revised *ISTA List of Stabilised Plant Names*, 7th edition.
- All genera were listed in groups 7 (forest species) and 8 (flower species). (In the previous version of the table there was just a reference to the ISTA Rules Table 2C, Part 2 or 3.)
- In some cases, a genus was added in more than one crop group (e.g. genera with species that can be cultivated for different purposes).
- The subgroups within the groups were removed, as the ISTA accreditation is granted for each crop group and not for subgroups.

3.7 Accreditation figures

In 2020, were performed 26 ISTA (re) accreditation audits out of 46 audits planned. The 22 audits not performed due to the Covid-19 pandemic are planned to be carried out in the first part of the year 2021.

If the ISTA audit cannot be performed with on-site assessment due to the restrictions imposed by the Covid - 19 pandemic a partially or complete remote audit is performed.

A complete list of accredited ISTA laboratories is shown in Table B.3.17. The regional distribution of the accredited laboratories is given in Figures B.3.19 a and b.

Table B.3.18 List of accredited laboratories – 2020

Country/Distinct Economy	ISTA Laboratory code
Argentina	AR01
Austria	AT04, AT04
Australia	AU01, AU02, AU06, AU07, AU09
Belgium	BE02, BE03
Bulgaria	BG01
Bolivia	BO01
Brazil	BR07, BR08
Canada	CA04, CA08, CA10, CA12

Switzerland	CH01
Chile	CL02
China	CN01, CN04
Czech Republic	CZ03
Germany	DE03, DE04, DE05, DE06, DE07, DE09, DE10, DE13, DE15, DE16, DE17, DE18, DE19
Denmark	DK03, DK04, DK06, DK08, DK09, DK11
Estonia	EE01
Egypt	EG01
Spain	ES01
Finland	FI01
France	FR02, FR03, FR07, FR08, FR09, FR11
United Kingdom	GB01, GB04, GB06
Greece	GR01, GR02
Croatia	HR03
Hungary	HU01, HU02
Indonesia	ID01, ID02
Ireland	IE01
Israel	IL01
India	IN05, IN06, IN07, IN12, IN14, IN16
Iran	IR01
Italy	IT01, IT03, IT06, IT07, IT09, IT10
Japan	JP01, JP03, JP05, JP06, JP07
Kenya	KE01
South Korea	KR02
Lithuania	LT01
Luxemburg	LU01
Latvia	LV01
Moldova	MD01
Malawi	MW01

Mexico	MX01
Netherlands	NL02, NL03, NL05, NL11
Norway	NO01
New Zealand	NZ01, NZ02, NZ03, NZ05
Philippines	PH03
Pakistan	PK01
Poland	PL05, PL07
Portugal	PT01
Romania	RO05, RO06, RO08
Serbia	RS01, RS02, RS03
Russian Federation	RU01, RU03, RU04, RU05, RU06, RU07
Sweden	SE02, SE07, SE09
Slovenia	SI01
Slovakia	SK01, SK02
Senegal	SN01
Thailand	TH03, TH04, TH05
Turkey	TR01
SCT of Taiwan, Penghu, Kinmen and Matsu	TW01
Tanzania	TZ02
Ukraine	UA01
Uganda	UG02
United States of America	US01, US03, US05, US06, US07, US10, US11
Uruguay	UY02
South Africa	ZA01, ZA03, ZA04, ZA05, ZA06
Zambia	ZM01
Zimbabwe	ZW01
Total number of accredited laboratories	146

There were 63 countries/distinct economies with at least one ISTA-accredited laboratory.

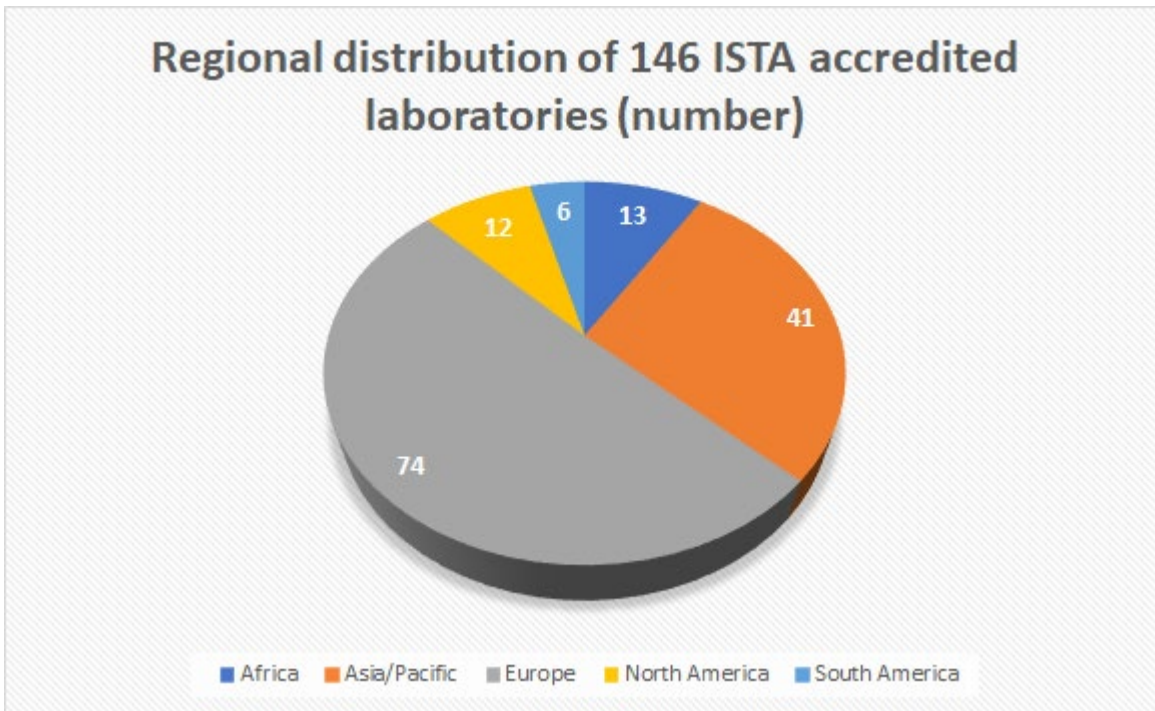


Figure B.3.19 a

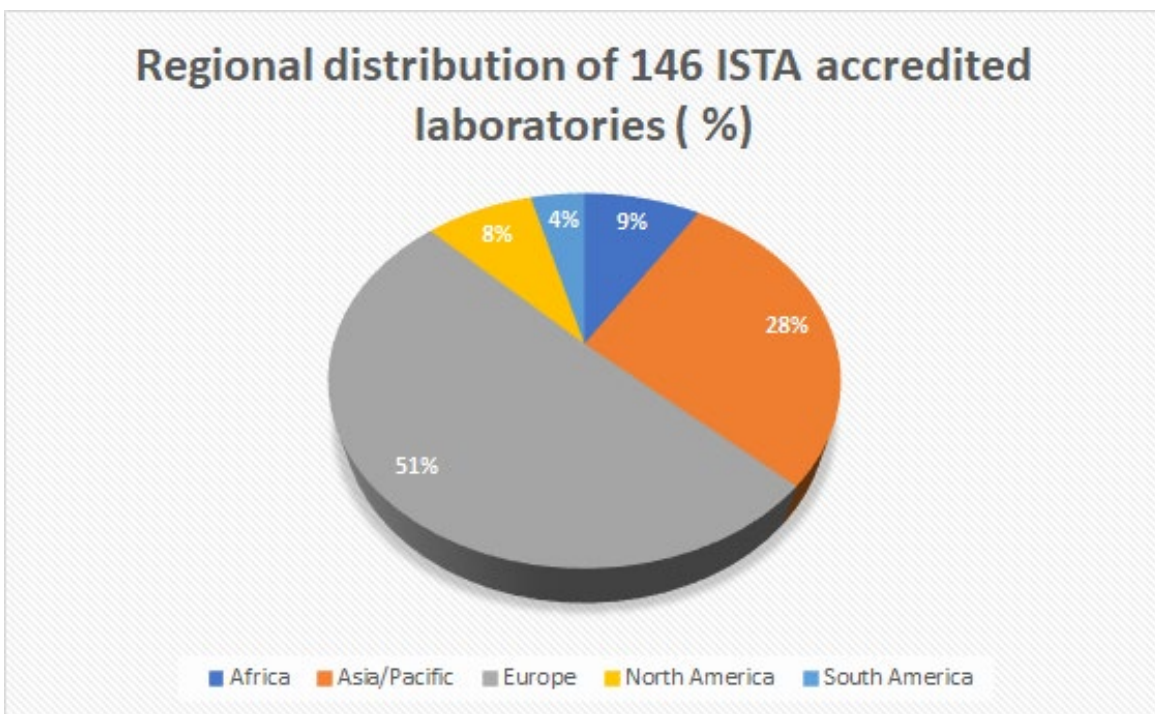
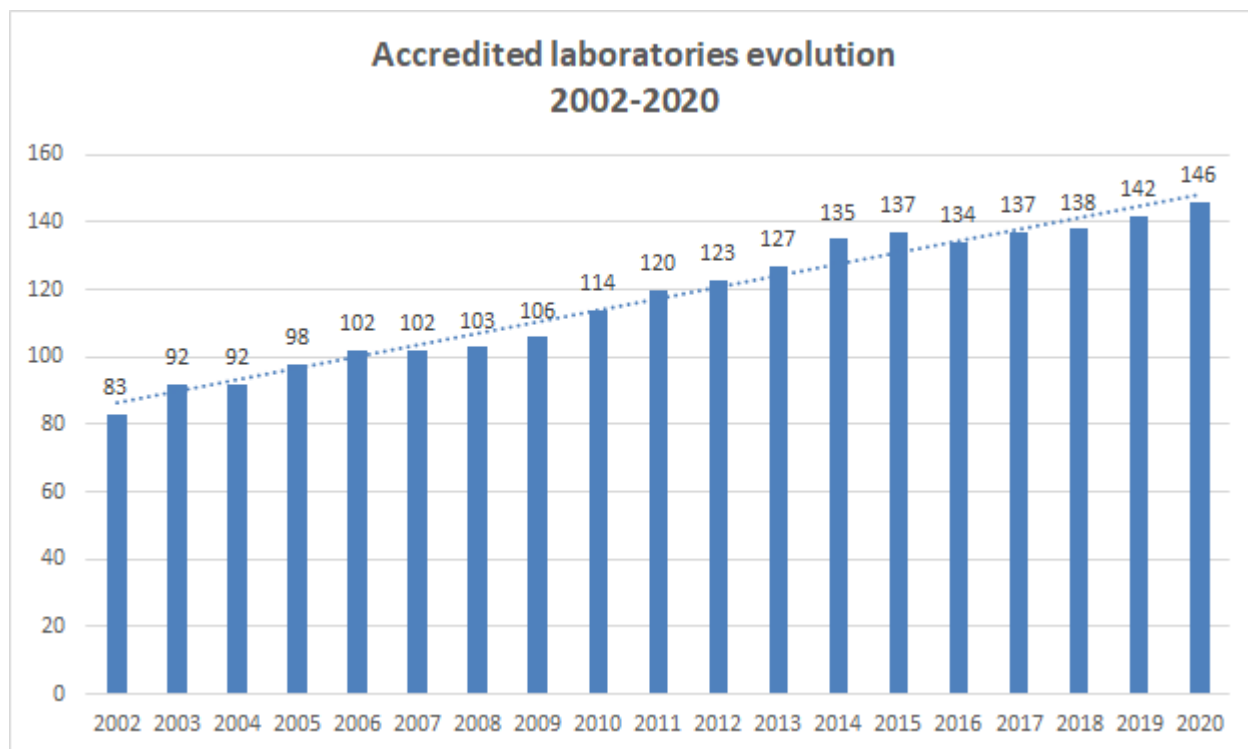


Figure B.3.19 b

Figure B.3.19 a and b. Regional distribution of the 142 ISTA accredited laboratories

Figure B.3.20 Number of ISTA accredited laboratories since 2002



3.8 New system auditor at ISTA Secretariat

The recruitment process for a new system auditor at ISTA Secretariat has been finalised.

3.9 Contracted auditors

In 2020 the Accreditation and Technical Department has continued to recruit new contracted system and technical auditors to perform ISTA audits.

3.10 Sales of ISTA Certificates

A total of 210400 certificates were sold by the end of the year (Table B.3.21).

Table B.3.21 Sales of ISTA Certificates

Type of ISTA Certificates	2013	2014	2015	2016	2017	2018	2019	2020
Orange International Seed lot Certificates	150700	190600	160300	158000	204000	190800	163700	202500
Blue International Seed Sample Certificates	7400	6300	10700	8500	14100	15100	11400	15400
Total	158100	196900	171000	166500	218100	205900	175100	217900

4. ISTA Publications and Products

4.1 ISTA Handbooks and Proceedings

Table B.4.1. Total sales of ISTA publications 2016–2020

Type/year	2016	2017	2018	2019	2020
Handbook on Seed Sampling	19	8	7	6	0
Handbook on Seedling Evaluation	46	22	6	54	40
Handbook on Pure Seed Definitions	16	6	10	12	5
Handbook on Moisture Determination	15	9	8	11	4
Handbook on Flower Seed Testing	4	3	7	3	12
ISTA Working Sheets on Tetrazolium Testing Vol. I	8	3	6	4	1
ISTA Working Sheets on Tetrazolium Testing Vol. II	6	2	1	6	3
Various Handbooks/Publications	66	26	50	44	15
Total Publications sold	180	79	95	140	80

4.2 Calibration Samples

The Secretariat offers calibration samples of the grass species *Dactylis glomerata* (3.0 g) and *Poa pratensis* (1.0 g) for General Seed Blowers.

In 2020 3 samples of *Poa pratensis* and 4 of *Dactylis glomerata* were sold.

5. ISTA Training and Education Programmes

5.1 ISTA Workshop overview

In 2020, seven workshops needed to be cancelled due to the Covid-19 pandemic.

6. Scientific Journal 'Seed Science and Technology': Report of the Editorial Board

Chief Editor:

Fiona R. Hay (The Philippines)

Deputy Editor:

Alison A Powell (United Kingdom)

Vigour (tests, causes of etc), physiology of ageing, also molecular aspects of ageing within limits (on the whole SST papers stay within these!), priming

Associate Editors:

Christophe Bailly (France)

Dormancy, ageing, cell signalling, oxidative stress, markers of seed vigour

Laura Bowden (United Kingdom)

Seed quality, priming, storage

Steven P.C. Groot (Netherlands)

Seed vigour, storage

Fabio Gresta (Italy)

Legume germination, hard seed coat, seed dormancy and dormancy breaking, scarification, seed treatment, weed germination, temperature, light

Valerie Grimault (France)

Seed Health

Brigitte Hamman (South Africa)

Seed germination, seed quality, seed vigour testing, seed enhancement, chemical seed treatments, seed biochemistry and physiology, dormancy, longevity (storage)

Julio Marcos-Filho (Brazil)

Seed physiology and seed quality control, as seed vigour (relationship with seed performance; testing), germination, priming, storage, ..

David Mycock (South Africa)

Seed storage (orthodox and the range to Recalcitrant) in particular Cryostorage; Germplasm conservation; plant cell, tissue and organ culture; plant cell biology

Daniel Perry (Canada)

Variety identification, molecular or DNA markers, polymerase chain reaction (PCR), microsatellite, simple-sequence-repeat, single-nucleotide polymorphism (SNP)

Moctar Sacandé (United Kingdom)

Seed storage, recalcitrant species, germination/dormancy

Uma Rani Sinniah (Malaysia)

Tropical crops germination, storage

Michael Sussman (United States)

Biomolecular techniques and principles pertaining to biotechnology and molecular biology

Alan Taylor (United States)

Seed treatment and coating technologies; Seed water activity/moisture content; Seed quality related to germination/viability

Christopher Wood (United Kingdom)

low temperature storage, dormancy and orchid/palm related papers

Andrea Mondoni (Italy)

Seed dormancy, germination, storage

Shyam S. Phartyal (Germany)

Irfan Afzal (Pakistan)

Ibrahim Demir (Turkey)

Sergey Rosbakh (Germany)

The task of the editorial board is to edit the ISTA scientific journal „Seed Science and Technology“.

Seed Science and Technology (SST) is one of the leading international journals featuring original papers and review articles in all areas of seed quality and physiology as related to seed production, harvest, processing, sampling, storage, genetic conservation, habitat regeneration, distribution and testing.

SST is published in three issues per volume and year with approximately 600 pages.

6.1 Editorial figures for 2020

Papers received: 120

Papers accepted for publication: 42

Papers rejected: 90

Papers published in 3 (virtual) issues: $14 + 18 + 12 = 44$

Full papers in 3 issues: $8 + 10 + 8 = 26$

Research Notes in 3 issues: $5 + 7 + 3 = 15$

Editorial Articles in 3 issues: $1 + 1 + 1 = 3$

Pages published in 3 issues: $134 + 169 + 122 = 425$

Average number of pages per paper: 9.7

Issues published online: 3 (April, August, December)

6.2 Sales of ‘Seed Science and Technology’ 2016– 2020

	2016	2017	2018	2019	2020
SST Print	125	101	0	0	0
SST Online Single	7	9	0	1	0
SST Print+ Online single	4	4	0	0	0
SST Print+ Online Multiple	6	5	0	0	0
SST OnlineMulptle	32	35	3	0	0
SST Back Issues, print	3	5	5	1	0
SST Dowload of Individual Chapters	23	27	18	9	13
SST Open Access Fee Full Lengh Paper			18	11	12
SST Open Access Fee Research Note			11	11	10
Total SST	200	186	55	33	35

7. Seed Science Advisory Group

MEMBERSHIP LIST			
			change comments
1	CHAIR: Alison Powell	United Kingdom	
2	VICE CHAIR: Brigitte Hamman	South Africa	
3	Birte Boelt	Denmark	
3	Francoise Corbineau	France	
4	Malavika Dadlani	India	
5	Joel Lechappe	France	
6	Stan Matthews	United Kingdom	
7	Alan Taylor	United States	
8	Manuela Nagel	Germany	
9	Jane Thomas	United Kngdom	
10	Adel Zayed	USA	
	ECOM liaison: Leena Pietala	Finland	

Activities, based on Terms of Reference (TORs):

TOR 1: To provide a link between fundamental research and the use of that research to meet the needs of ISTA members.

- A. Prediction of normal germination using an early radicle emergence count: An article to explain the project in terms of proof of concept, the results accumulated so far, future work and its final purpose has been published in Seed Testing International. (The potential for new approaches to seed testing: the role of the Seed Science Advisory Group, Seed Testing International (2020), 159, 18 – 22).

This project continues in 2019-2022 with the collaboration of the Germination Committee and will examine the potential for prediction of normal germination in other crop groups. Six ISTA laboratories have volunteered to complete the work and five species have been selected for testing in collaboration with these laboratories. Three laboratories have completed testing and results have been returned by two of them, Unfortunately, due to work restrictions resulting from the COVID pandemic, other laboratories have not yet been able to work on the project.

- B. Use of tetrazolium chloride staining to predict germination of wild species: The project established to test this hypothesis on wild-flower species with the collaboration of the Flower Seed Committee has not been taken forward so far due to restrictions associated with the pandemic.
- C. The Storage Committee was approached regarding a possible project to use an early count of radicle emergence to predict storage potential in commercial storage conditions and / or as a rapid assessment of germination during gene bank storage. There was no interest expressed by laboratories from the committee.

TOR 3: Respond to requests from ECOM and TCOM Chairs for advice related to scientific issues.

A proposal was prepared for a possible new area of work for ISTA, to be considered initially by the ECOM. Our proposal was a response to the increase in interest in more ecological emphasis in farming, a reduction in

chemical inputs, and an increase in the market for bio-stimulant and biocontrol seed treatments. There are, however, no guidelines or general methodologies for evaluating these treatments on seeds. Our proposal provided the background to these developments. The proposal also questioned whether ISTA might have a new field of activity with the development of biocontrol and bio-stimulant seed treatment assessment methods, as part of its official mission to develop testing methods for the assessment of seed quality by ISTA's laboratories. This proposal and a suggested action plan have been discussed with the ECOM.

8. Wild Species Working Group

MEMBERSHIP LIST			
			change comments
1	CHAIR: Gil Waibel	USA	
2	VICE CHAIR: Ruoqing Wang	Canada	
3	Riad Z. Baalbaki	USA	
4	Laura Bowden	United Kingdom	
5	Ted Chapman	USA	
6	Rachael Davies	United Kingdom	
7	Stefanie Krämer	Germany	
8	Heidi Larson	USA	
9	Sergio Pasquini	Italy	
10	Alison A. Powell	United Kingdom	
11	Victor Vankus	USA	
12	Rita Zecchinelli	Italy	
	ECOM liaison officer: Craig R. McGill	New Zealand	

During the past year, the Wild Species Working Group has worked to develop a web site (wild-seeds.net). The web site is available of review, and we are in the process of adding content. Several methodology chapters have been written and posted, and others are being written. A protocol page has been designed but protocols will not be available until we have adequate material to share. A limited number of seed images have been posted to help us develop the gallery, along with functional search mechanisms are in development. We will be adding images to the gallery as they are available. A comprehensive glossary has been developed and offers a compilation of definitions including those offered by seed testing organizations. Combining definitions can be helpful to some web site users to pinpoint the meaning of a term. An algorithm will be developed to help efficiently build the protocol sheets. In addition, a hovering feature (over any term posted on the website) is being created to automatically pull up the definitions in the glossary to help a reader understand terminology when needed. We are thankful for the support and donations from many ISTA, many seed companies, and the American Seed Trade Association (ASTA). For those curious who has donated to the working group, see <https://wild-seeds.net/about/donors/>.

Once the web site's development and content are well underway, we will be looking for volunteers from around the world to help us build the protocol sheets of species from many countries and/or regions. Any seed analysts or researchers who would like to help are invited to contact Gil Waibel (gpwaibel@gmail.com).

9. Report of the ISTA Secretariat

9.1 Secretariat staff

This report lists the activities and changes in the Secretariat during 2020, where the Secretariat went through a number of personnel changes:

The Publication, Marketing & Communication Specialist, Fabiola Rivera Navas, decided not to return from maternity leave in May 2020. The role was taken over by Yoana Uzunova, Her role as Marketing & Communication Assistant was taken by Karen de La Rosa, who was acting as an intern in this group. From November 2020 Sven Molenaar was employed on a temporarily base to act as maternity leave replacement for Yoana.

On Publication (Rules, ISTA Handbooks and Website) Vanessa Sutcliffe of HeartWood Editorial assists the Secretariat with respect to proofreading and InDesign publication now as well for the STI publication.

A junior auditor joined beginning 2020. The contract was terminated during probation. The recruitment process was restarted and a new person will start March 2021.

Thus, at the end of the year 2020 the Secretariat numerates the following 12 members of staff corresponding to 10.2 full time equivalent employees:

Role	Name	%FTE
Secretary General	Dr. Andreas Wais	1
Head of Accreditation and Technical Department / Acting Secretary General	Dr. Florina Palada	1
TCOM Manager	Nadine Ettel	0.6
TCOM Administration	Andreea Nicoleta Militaru	0.8
System Auditor, Quality Management & Standard PT Coordinator	Branislava Opra	1
System Auditor	NN	
Accreditation and Audit Administration	Neelam Lagah	1
Finance, Sales and HR Management	Agnes Hegedüs	1
IT/Publication Specialist	Sejal Patel	1
Events, Membership and Documentation Manager	Olga Stöckli	1
Publication, Marketing & Communication Specialist	Yoana Uzunova	0.6
Publication, Marketing & Communication Specialist	Sven Molenaar	0.6
Marketing & Communication Assistant	Karen de La Rosa	0.8

9.2 Secretariat work

A long-term goal of the Secretariat was to move to another location in the area. The search was successful and end of 2020 a contract was signed for a location in Wallisellen (Richtiring 32). This new location is more modern build facility with better infrastructure (i.e Internet capabilities, safety both to reach and work also late hours, social possibilities, and energy wise). A move is scheduled End Q1/Start Q2 2021.

9.3 Function

9.3.1 Administration

Lead by Secretary General. The Administration team includes Agnes Hegedüs and Olga Stöckli.

The main tasks of Agnes are the financial administration, invoicing, settling all incoming and outgoing payments, ISTA publications and products sales administration, general office, HR assistance and time recording administration, as well as membership administration on the financial aspects.

Olga is responsible for the Events organization, Administration documentation and all Membership administration. She leads the documentation and preparation of the contractual agreements needed upfront ISTA events. Olga is responsible for the registration process. ISTA events include, but are not limited to, OGM, Congresses and ECOM Meetings. Membership administration includes receiving and responding to membership queries; managing the membership database; handling all communication with members regarding their membership and payments and coordinating the assignment of designated authorities and voting nominations. Olga's responsibility increased due to the implemented PL process for the Annual Meetings and Congresses.

9.3.2 Human Resources

The Secretary General heads HR. Agnes Hegedüs took over HR Assistant tasks since 2017.

Agnes, Florina Palada and the Secretary General maintained the HR Handbook, which is updated every year.

January 2020 ISTA issued a 4-step pandemic plan. This was right before any measures concerning COVID-19 were required. This plan is still in place and at least monthly meetings of the Agnes, Florina and the Secretary General are held to adapt the plan due to current requirements.

9.3.3 Finance

The Secretary General oversees the finances of the Association in the framework of the annual budget. Accounting is divided between Ronny Dossenbach of Buff Treuhand AG and Agnes Hegedüs. ISTA accounts are annually audited by BDO AG.

As requested by the auditors, the ECOM started a project to register the association in the Swiss Commercial Register as an Association. This project is ongoing and will allow ISTA to work more effectively and seamlessly with institutions within Switzerland. The project is under finalisation with the ISTA lawyer Thomas Brunner.

Following the Office365 initiative all bookkeeping is now virtual. This does not only save paper, but also showed clear benefits during the COVID-19 measures like home office, as documents were exchanged easily between different locations.

9.3.4 IT

Computing hardware, connectivity and software outsourcing to Prisma was changed to InfoPro, a company in Bern, which is also acting as a place of the ISTA virtual storage of data and host for all ISTA used programs and databases. The change was necessary, as Prisma cannot deliver such service and were necessary not only to complete all IT solutions being cloud based, but also as a cost saving exercise. Prisma will continue to serve ISTA in the area of Invoice preparations. On cost saving the 24/7 hardware maintenance by Itrix was cancelled as well. The current website is hosted by MySign AG (maintenance of the website contents is done by the secretariat staff).

A software change to Office365 was done in 2019 and nearly completed in 2020. This process is ongoing and under the project management of Sejal Patel. During 2020 and the COVID-19 pandemic ISTA also transferred this system as to be used by TCOMs, ECOM and other external cooperates (including auditors) to have access to areas of ISTA document drives, where it is needed for a seamless communication. The project also allows TCOMs to increase their internal communication as well the communication with the Secretariat. Most TCOMs make use of this by now.

In Q4 2020 ISTA introduced LinkedIn learning as a tool for staff training in the Secretariat. This will be continued in 2021.

Both Office365 solutions and LinkedIn learning are delivered to ISTA on a reduced rate (NPO rate).

9.3.5 Marketing

Social media and digital marketing

The ISTA YouTube channel has 560 subscribers, which is a four-fold increase since 2019. All relevant actions are now posted here and it became the main host for all ISTA video information.

Further ISTA continued to use its Twitter account, which is used for quick information to the stakeholders and interested parties. ISTA has now more than 1200 followers on Twitter, nearly doubling the number during last year.

At the end of 2020, the ISTA LinkedIn profile counted over 7'000 followers. This corresponds to an increase of about 25 % as compared to the same time a year before. Posting on LinkedIn is done up to three times a week.

The posts mainly include news about the association. LinkedIn allows more in-depth information as it is not limited to the number of signs, like Twitter.

Key performance indicator reports of all social media are shared within the Marketing Working Group.

The website requires a change of CMS, as the old one will not be supported anymore and does not allow a lot of changes as well not a perfect view on mobile devices, which are more and more used. After the approval of the budget by the Ordinary General Meeting a project was started to renew the website completely. The outcome will be a new website with new features serving the needs of the ISTA stakeholders. It will be launched within 2021.

World Seed Partnership

The World Seed Partnership (WSP) is a joint initiative by now five international organizations:

- International Seed Testing Association (ISTA)
- International Seed Federation (ISF)
- Organization for Economic Co-operation and Development (OECD)
- International Union for the Protection of New Varieties of Plants (UPOV)
- World Farmer Organisation (WFO)

The mission of the World Seed Partnership is to provide a focal point for information on internationally harmonised seed systems and to communicate their role in supporting sustainable agriculture.

Regular web conferences took place in 2020 in order to move this project forward. A project defined was a joined initiative in Nigeria. Due to the COVID-19 situation no new projects were defined for 2020.

9.3.6 Representation

During 2019, ISTA was represented by the Officers, other ECOM Members, the Secretary General, other Secretariat staff or other ISTA members at all major events of partner organisations, international seed trade associations, scientific and other international organisations in the area of seed science and politics. This resulted in closer cooperation with SAA, AOSA/SCST, OECD, FAO, APSA, AFSTA, Euroseeds (formerly ESA), UPOV and ASTA. The Secretary General also had contact with several DAs.

A special focus was the finalisation and signature of a Memorandum of Understanding between APSA and ISTA to cooperate in the area of seed testing in Asia to achieve uniformity of seed testing in the region.

9.3.7 Event organization

New way to work had to be developed for ISTA and across the world. ISTA is a global organisation and faced a number of challenges. Decisions were made to cancel the Annual Meeting in Verona and following the emergency Swiss COVID laws held the OGM vote by email. Although a difficult situation the result was that 48 out of the 53 ISTA Designated voting members eligible to vote for their countries/distinct economies voted on the annual OGM agenda topics and ISTA Rules proposals we had discussed via the virtual meetings. This is largest number of eligible ISTA members voting for many years.

9.3.8 Publications

ISTA Rules

The updating, formatting, coordination and integration of the different translations and other required maintenance of the source files performed by Vanessa Sutcliffe with support of the Secretary General, Nadine, Andreea, Karen with support from the Rules TCOM. The rules were published December 01, 2020, to enable laboratories to access the changes on time.

Seed Testing International (STI)

An editorial team of STI consisted of Andreas, Florina and Sejal (as the responsible person for STI).

Mailing lists and distribution was organised by Agnes.

The two scheduled issues of STI (no.159 and no. 160) were successfully and timely produced and distributed due to the leadership of Sejal.

Seed Science and Technology (SST)

The Editorial Board headed by Fiona Hay edits SST.

Uploading of Fast-track and the final articles and amending the DOI registrations is implemented by SST typesetter Lucie Eng.

Current Website

Only the Marketing & Communication group at the Secretariat maintains the website upon request on Secretariat staff information depending on their relevant role.

The project towards the redesign and construction of a new ISTA website is described above.

Newsletters

Newsletters are prepared weekly by the Marketing team. Different members of the Secretariat staff depending on the subject contribute to these Newsletters.

9.3.9 TCOM

Nadine does coordination of the TCOM work together with Andreea, this includes:

The on-going coordination and management of the TCOMs annual cycle including all reports and studies, information updating of the TCOM web sites.

Coordination and administration of the Method Validation Programme.

Set-up and coordination of the 100K-project as well as the SH-project (seed as a pathway), which is running in Geves.

Leading the organisation of the DNA, GMO and SH Proficiency Test rounds and communication with laboratories, data entry and management.

Andreea is coordinating the workshops organisation, registration and management, TCOM Members and handling TCOM Membership Applications, updating TCOM website. Workshops were not performed in 2020 due to travel restrictions. A program was set up to perform also online workshops, which will start in 2021.

Training and maintenance of the TCOM area in Office365 is done by Nadine and Andreea.

9.3.10 Accreditation

Florina manages the accreditation as Head of the Accreditation and Technical Department.

Auditing

Organized, arranged and partly performed by Florina and Branislava with support of Neelam, as well as a team of contracted system and technical auditors around the world.

Activities include:

- Pre-accreditation and pre-audit activities related to the interested laboratories/sampling entities
- Initial and re-accreditation audits of applicants and existing accredited laboratories/sampling entities
- Following up of corrective actions

Neelam provides the Audits administration and Certificate shipment and administration.

Neelam is providing administrative support to the Accreditation and Technical Department; this includes coordinating with the laboratories and the auditors the Audit schedule. Assisting with materials and documentation in preparation for audits. Making travel arrangements for the Auditors.

Organizing and conducting a Proficiency Test Programme as well as the Mini-Proficiency Test Programme

Standard PT is under the responsibility of Branislava, Neelam supports her.

Work includes:

- Obtaining seed for some Proficiency Test rounds
- Managing registration
- Obtaining relevant documents for shipment
- Shipment
- Data entry and analysis
- Reporting

Other activities of the Accreditation and Technical Department

- Organisation of Quality Assurance Workshops
- Training of the new system auditor at ISTA Secretariat
- Recruiting and training of contracted system and technical auditors
- Recruiting of a junior system auditor in the Secretariat for 2019
- Optimisation of the database

Certificates

Two projects are currently running concerning ISTA Certificates.

- **Electronic Certificates.** After a feasibility project performed by Massey University, Palmerstone North (NZ) and approval of the Budget by the 2020 Ordinary General Meeting. A project was started with MySign to realise the use of electronic Certificates. The Website will play a major role in this project. A beta testing is foreseen in Q3/4 2021. The project is led by the Secretary General.
- **Interactive Certificates:** This project, which enables ISTA laboratories to learn more about ISTA Certificates and their use (how to fill where and what). It is also be used for trainings within ISTA laboratories. The project was completed early 2020 with the help of Branislava and Florina.

10. Finances of the Association

In January 2021, the ISTA accounts were audited by financial auditors BDO AG, who found them to be in well order. The report of the financial auditors is included after the presentation of the key financial figures.

The total turnover decreased by 9.8 % compared to previous year mainly due to less audits in 2020, where the income in 2020 is only realised in 2021 and therefore went into the accruals and released in the 2021 budget. Therefore, the 2021 budget shows a higher income in audits than in regular years. The sales of Certificates did rise, but could not catch-up with this loss. The turnover decreased to a total of 2'598'014 CHF for 2020, which is significantly lower than the 2020 budget (2'933'908 CHF). Reasons for this are highlighted below. The financial result shown for the year 2020 is positive, with a balance of 40'838 CHF. In 2020 despite planning no money had to be taken from the reserves, i.e., all projects financed could be served by the regular budget.

Some areas to highlight include:

Membership subscription: The increase of 4'186 CHF compared to previous year was neglectable but was 41'583 CHF higher than budgeted. This was due to an increase of membership and less use of the 10% early bird discount.

ISTA Annual Meeting: The ISTA Annual Meeting in Verona was cancelled and held virtually due to the COVID-19 pandemic. Nonetheless, due to the late cancellation payments mainly to the convention hotel had to be made before the cancelation, which could not be recovered. Further payments on planning occurred for the ISTA Annual Meeting. Therefore, there were expenditures of 62'487 CHF with no income against them. Contracts will be made in future with taking pandemic risks into consideration, but losses in these cases may not totally be avoided. As the

Annual Meeting to be held 2021 in Cairo was decided by the ISTA Executive Committee to be held virtually, the budget on income was set zero for 2021 and the expenditure was set to 10'000 CHF to cover the preparatory expenses and the expenses for any virtual cost.

ISTA Rules sales: Sales increased again marginally by 786 CHF compared to previous year. The discount of single chapter sales beginning of 2020 had no effect on the sales volume.

Accreditation: Due to more accreditations expected in 2020 a higher income was budgeted (increase of 61'230 CHF), which was partially a direct effect from the ISTA Congress in Hyderabad. Due to COVID-19 pandemic 22 audits planned for 2020 had to be postponed to 2021. The reason for the lower income on audits of 191'829 CHF is mainly due to this reduction, which needed to be put in the accruals and released to the 2021 budget, which now has an all-time-high of 716'625 CHF. Expenditures had to be adapted accordingly.

Seed Science and Technology subscriptions: The income from sales and publication fees staid stable compared to previous year.

For 2021 a balanced budget is presented with an expected result of 1'017 CHF an using 855'000 CHF from the reserves, which is mainly due for eCertificates, new website, 3 years of the 100'000 CHF project and the one-off office cost. All these projects with some smaller ones mount up to 914'331 CHF, which means that part can be covered by the cash flow.

The reserves stay at end of 2020 stable at 4'610'000 CHF. That means that the 2020 budget could completely be financed from the cash flow, despite projects were financed during 2020, which were foreseen to come out of the reserves.

ISTA draft Budget 2021	2019	2020	Budget 2021	Proposed 2022
INCOME				
<i>Subscriptions</i>				
Annual Membership Subscription	1'232'104.72	1'236'291.17	1'206'328.95	1'220'000.00
Accreditation Subscription	164'046.75	164'138.40	166'366.08	170'000.00
Annual Meetings	217'834.24	0.00	0.00	145'000.00
Technical Committees WS	27'816.41	0.00	90'000.00	60'000.00
STI Advertisement	1'538.06	0.00	1'500.00	1'000.00
	1'643'340.18	1'400'429.57	1'464'195.03	1'596'000.00
<i>Service Centres</i>				
ISTA Rules	49'414.76	50'200.64	55'000.00	55'000.00
Accreditation Audits	573'567.63	442'969.00	716'625.00	655'000.00
Proficiency Test incl. GMO	6'410.00	6'000.00	11'000.00	10'000.00
QA Workshops	13'724.38	0.00	12'000.00	10'000.00
Seed Science and Technology	21'356.79	21'317.09	25'000.00	25'000.00
Technical Publications and calibration samples	25'051.40	19'510.22	20'000.00	20'000.00
Certificates	582'061.00	678'925.00	666'250.00	650'000.00
Website	0.00	0.00	0.00	0.00
	1'271'585.96	1'218'921.95	1'505'875.00	1'425'000.00
Losses in receivables	-34'248.00	-21'337.53	-15'642.00	-15'000.00
Total Income	2'880'678.14	2'598'013.99	2'954'428.03	3'006'000.00

EXPENDITURE				
<i>Direct Costs</i>				
Annual Meetings & Congresses	-447'766.08	-62'487.22	-10'000.00	-180'000.00
Executive Committee+President	-59'606.89	-15'486.40	-25'000.00	-25'000.00
Technical Committees WS and 3K grants	-182'265.84	-55'410.74	-117'000.00	-96'000.00
Seed Testing International	-41'200.93	-31'087.90	-30'000.00	-30'000.00
	-730'839.74	-164'472.26	-182'000.00	-331'000.00
<i>Service Centres</i>				
ISTA Rules	-13'821.19	-11'676.51	-18'500.00	-20'000.00
Accreditation Audits	-251'879.66	-153'901.99	-463'200.00	-360'000.00
Proficiency Test incl. GMO	-14'841.82	-45'303.23	-30'500.00	-30'000.00
QA Workshops	-14'128.00	0.00	-11'500.00	-10'000.00
Seed Science and Technology	-59'261.61	-55'798.42	-55'000.00	-55'000.00
Technical Publications and calibration samples	-12'285.20	-5'786.24	-15'000.00	-15'000.00
Certificates	-83'606.33	-106'676.18	-90'000.00	-90'000.00
Provisions for fluctuations	150'000.00	0.00	855'000.00	100'000.00
	-299'823.81	-379'142.57	171'300.00	-480'000.00
<i>Personnel expenses</i>				
Salaries	-1'120'039.95	-1'164'760.30	-1'218'368.74	-1'250'000.00
Social Security and insurances	-272'576.25	-281'387.50	-365'510.62	-375'000.00
Other personnel expenses incl. Recruitments	-18'990.97	-25'583.06	-5'000.00	-5'000.00
Staff Training	-18'757.69	-9'519.54	-30'000.00	-30'000.00
Secretary General Cost not covered otherwise	0.00	0.00	-5'000.00	-30'000.00
	-1'430'364.86	-1'481'250.40	-1'623'879.36	-1'690'000.00
<i>Operating Costs</i>				
Office Costs	-241'929.06	-241'774.82	-274'000.00	-274'000.00
Travel Costs (International Representation)	-32'362.13	-28'677.89	-40'000.00	-40'000.00
Marketing Costs	-26'060.89	-23'795.43	-25'000.00	-25'000.00
Website	-24'742.16	-40'880.77	-30'000.00	-30'000.00
Projects	0.00	0.00	-914'331.44	-100'000.00
	-325'094.24	-335'128.91	-1'283'331.44	-469'000.00
Depreciation of tangible fixed assets	-2'756.87	-2'415.78	-2'000.00	-2'000.00
Financial costs	-162'860.25	-297'377.38	-35'000.00	-35'000.00
Financial income	54'809.17	35'470.21	1'500.00	1'000.00
Prior-period costs	-13'793.06	-510.97	0.00	0.00
Prior-period income	37'378.91	67'651.57	0.00	0.00
Total Expenses	-2'873'344.75	-2'557'176.49	-2'953'410.81	-3'006'000.00
Result	7'333.39	40'837.50	1'017.22	0.00

Activity Report of the ISTA Committees 2020

2020 YEAR END CLOSING	ACCOUNT 2018	ACCOUNT 2019	ACCOUNT 2020
ASSETS			
<i>Currents Assets</i>			
<i>Cash</i>			
Petty Cash (Accounts 1000,1001,1002)	2'320.21	6'008.88	5'314.40
Postal account (Accounts 1010,1011,1015,1016)	84'365.06	118'873.46	68'439.07
Zürcher Kantonalbank, current account (Account 1020)	6'456'233.50	1'477'830.92	2'520'248.84
Zürcher Kantonalbank, deposit account (Account 1021)	140'472.71	499'666.17	499'248.70
Zürcher Kantonalbank, USD account (Account 1025)	82'968.24	65'614.21	2'941'954.79
Zürcher Kantonalbank, EUR account (Account 1026)	22'117.95	1'079'575.20	1'005'148.48
Zürcher Kantonalbank, EUR account Congrss (Account 1030)	4'861.51	0.00	0.00
Zürcher Kantonalbank, GBP account Congrss (Account 1031)	62'316.93	58'723.24	43'092.27
	6'855'656.11	3'306'292.08	7'083'446.55
<i>Trade receivables</i>			
Membership subscriptions, certificates and publications (Accounts 1100,1111,1112,1113)	30'829.87	74'622.70	33'737.91
Allowance on doubtful accounts (Account 1120)	-3'000.00	-7'000.00	-3'500.00
	27'829.87	67'622.70	30'237.91
<i>Other accounts receivable</i>			
Other accounts receivable (Account 1108,1109,1110,2320)	25'475.66	16'021.78	44'036.45
Withholding tax (Account 1150)	401.87	11'973.37	11'615.67
Value added Tax (Account 1155,1156,1157,2055,2057)	13'608.93	10'189.04	12'180.79
	39'486.46	38'184.19	67'832.91
<i>Accrued income and prepaid expenses</i>			
Prepaid expenses (Accounts 1300)	179'689.97	438'201.54	79'916.15
	179'689.97	438'201.54	79'916.15
<i>Fixed assets</i>			
Financial assets (Account 1400,1410)	135'724.00	3'319'441.98	154'118.00
Tangible fixed assets (Accounts 1500,1520)	7'400.00	5'500.00	5'900.00
	143'124.00	3'324'941.98	160'018.00
	7'245'786.41	7'175'242.49	7'421'451.52

Activity Report of the ISTA Committees 2020

LIABILITIES + EQUITY			
Short-term liabilities			
Trade creditors (Account 2000,2001,2002,2005,2006,2007)	-24'353.77	-57'700.72	-54'602.58
Other accounts payable (Accounts 2200,2220,2250,2260,2270,2280,2321)	-42'575.45	-20'613.25	-33'948.70
Advance payments (Accounts 2100,2101,2102,2103,2104,2106,2107,2108,2109,2110,2112)	-	-	-
Accrued expenses (Accounts 2120,2121,2122,2123,2124,2125,2126,2127,2128,2129,2300,2310,2350,2355,2360,2366,2367,2370,2371)	1'400'233.96	1'423'873.53	1'514'065.20
	-140'691.46	-177'789.83	-282'732.38
	-	-	-
	1'607'854.64	1'679'977.33	1'885'348.86
Long-term liabilities			
Provisions (Account 2910)	-	-	-
	4'760'000.00	4'610'000.00	4'610'000.00
	4'760'000.00	4'610'000.00	4'610'000.00
Equity			
Equity (Account 2800)	-861'128.43	-877'931.77	-885'265.16
Profit/Loss (Account 2998)	-16'803.34	-7'333.39	-40'837.50
	-877'931.77	-885'265.16	-926'102.66
	-	-	-
	7'245'786.41	7'175'242.49	7'421'451.52



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8031 Zurich

**Report of the statutory auditor on the limited statutory examination
to the Ordinary General meeting of**

ISTA International Seed Testing Association, Bassersdorf

As statutory auditor, we have examined the financial statements (balance sheet, income statement and notes) of ISTA International Seed Testing Association for the financial year ended December 31, 2020.

These financial statements are the responsibility of the executive committee. Our responsibility is to perform a limited statutory examination on these financial statements. We confirm that we meet the licensing and independence requirements as stipulated by Swiss law.

We conducted our examination in accordance with the Swiss Standard on the Limited Statutory Examination. This standard requires that we plan and perform a limited statutory examination to identify material misstatements in the financial statements. A limited statutory examination consists primarily of inquiries of company personnel and analytical procedures as well as detailed tests of company documents as considered necessary in the circumstances. However, the testing of operational processes and the internal control system, as well as inquiries and further testing procedures to detect fraud or other legal violations, are not within the scope of this examination.

Based on our limited statutory examination, nothing has come to our attention that causes us to believe that the accompanying financial statements do not comply with Swiss law and the articles of association.

Zurich, 29 January 2021

BDO Ltd

David Schraner
Auditor in Charge
Licensed Audit Expert

i.V. Niklaus Stamm
Licensed Auditor

Enclosures
Financial statements

BDO Ltd, with its statutory seat in Zurich, is the legally independent Swiss member firm of the international BDO network.

C. Reports of the Technical Committees

You will find on the following pages the reports of the Technical Committees for the calendar year 2020. These reports give an indication of progress towards achievement of the working programmes approved by the TCOM.

Activity Working Programmes arranged in alphabetical order of Committee:

ATC	Advanced Technologies Committee
BSC	Bulking and Sampling Committee
FSC	Flower Seed Committee
FTS	Forest Tree and Shrub Seed Committee
GER	Germination Committee
GMO	GMO Committee
MOI	Moisture Committee
NOM	Nomenclature Committee
PUR	Purity Committee
SHC	Seed Health Committee
STA	Statistics Committee
STO	Storage Committee
TEZ	Tetrazolium Committee
VAR	Variety Committee
VIG	Vigour Committee

1. ATC Advanced Technologies Committee

A. COMMITTEE MEMBERSHIP LIST				
			change comments	
1	CHAIR: Bert van Duijn	Netherlands		
2	VICE-CHAIR: Francisco G. Gomes Jr.	Brazil		
3	Birte Boelt	Denmark		
4	Kent Bradford	United States		
5	Mailén Ariela Martínez	Argentina		
6	Henry Bruggink	Netherlands		
7	Aurélie Charrier	France		
8	Devaraja Achar	India		
10	Zhujun Zhu	China		
11	Brigitte Hamman	South Africa		
12	Mieczysław Grzesik	Poland		
13	Tomoko Sakata	Japan		
14	Sebastian Bobber	Germany		
15	Giovanny Lopez	Netherlands		
B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
<u>B3. Scientific information publications</u>				
			remarks	
	Publication title	proposed	collaboration	
		finalisation	update	
			progress	
1	ATC Web-pages			Content to be added continuously
2	Report on the Hyderabad workshop for Tcom members.	2020	Tcom manager	Seed Testing International (2020) 159; 26
3	Overview of all image forming technologies and their application to seeds	Continues		Presented (partly) at different meetings. In prep for web publication.
4	Info paper on nanotechnology	2021		Working group established. Progress slow
5	Inventory of mathematical models in seed (testing)	December 2021		Inventory of (scientific) literature completed
6	Special feature issues of X-ray in seeds	2021		

7	Chapter X-ray imaging in "Handbook of Tree and Shrub seed testing"	Postponed	Tree and Shrub Seed Committee	
8	Advanced Technologies Committee Report	2020		Seed Testing International (2020) 160; 14
9	ISTA Special Project 19-1: Assessment on available technologies of imaging and image analysis for other seeds determination, purity analysis and germination	2020	PUR, GER	Seed Testing International (2020) 160; 40
10	ISTA Special Project 19-2: New technologies for other seeds determination	2020	PUR	Seed Testing International (2020) 160; 41
11				
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	Workshop on Imaging technologies for seed evaluation, Italy	June 8-11, 2020	Italy	Postponed till after Covid-19 issues are cleared
2	Workshop on advanced seed technologies	2021 (?)		Planned for St. Petersburg, Russia.
3				
4				
<u>C2 Seminars</u>				
				remarks
	Seminar subject	proposed	collaboration	update
	location	finalisation		progress
1	Seminars on advanced seed technologies	2020/2021		China postponed till after Covid-19 issues are cleared
D. Proficiency Tests				

	Proficiency Test Subject	proposed	collaboration	remarks update
		finalisation		progress

1
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E. QUESTIONS TO THE COMMITTEE

	subject of question			from
1				

1
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F. SPECIAL PROJECTS

	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
1	Overview of image forming technologies and their application to seeds	Continuous		For new ISTA web pages
2	X-ray seed imaging literature data-base for ISTA web pages	2021		For new ISTA web pages
3	Nanotechnology for seeds; a first exploration	2021		Working group established
4	Mathematical modelling in seed testing	2021		Working group established
5	Finding new technologies	continuous		
6	Imaging in Tree and Shrub seed testing”	2020	Tree and Shrub Seed Committee	Postponed
7	New Technologies for Other Seeds Determination	2021	PUR	ISTA sponsored special project
8	Assessment on available technologies of imaging and image analysis for other seeds determination (OSD), purity analysis and germination.	2021	PUR, GER	ISTA sponsored special project
9	Exploration of methods for detecting insects in seed lots	2022	SHC	ISTA sponsored special project

2. BSC Bulking and Sampling Committee

COMMITTEE MEMBERSHIP LIST				change comments
1	CHAIR: Eddie Goldschagg	South Africa		
2	VICE-CHAIR: Leena Pietilä	Finland		
3	Ignacio Aranciaga	Argentina		
4	Lotta Claesson	Sweden		
5	Corinne Guimier	France		
6	Gerry Hall	United Kingdom		
7	David Johnston	United States		
8	Birte Krogh	Denmark		
9	Michael Kruse	Germany		
10	Bülent Öztürk	Turkey		Joined 2020
11	Cza Realubit	The Philippines		
12	José Maurício Pereira	Brazil		
13	Justin Salter	New Zealand		Joined 2020
14	Evans Tembo	Zambia		
15	Ad Toussaint	Netherlands		
	Steve Jones (ECOM Liaison)	Canada		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods				
	Method name	proposed	collaboration	remarks
	subject	finalisation		update
				progress
1	Validation of the tube trier	2022		Working group established
2	Sampling of <i>Orobanche</i> & <i>Striga</i>	2022		Reinitiate working group
A2. Introduction of New Species				
	Species and test	proposed	collaboration	remarks
		finalisation		update
				progress
1				
A3. Introduction of Rules Changes				
	Subject	proposed	collaboration	remarks
		finalisation		update
				progress
1	Number of Sub-Lot Certificates	2023	ISF Veg WG, STA	Waiting for recommendation from ISTA/ISF Veg WG
2	Size of submitted and Working Samples for Vegetable Seed	2023	ISF Veg WG, STA	Waiting for recommendation from ISTA/ISF Veg WG
3	Seeds retained for ID after testing	2022	PUR	Under discussion
4	Soil & Boerner divider minimum channels	2021		Rule Change Proposal for 2021 approved by BSC
5	Revision of 2.2.12 Treated seed & 2.2.13 Coated seeds	2021		Rule Change Proposal for 2021 approved by BSC
6	Updating of descriptions of mechanical dividers	2021		Rule Change Proposal for 2021 approved by BSC
7	Storage of samples – reference to Chapters 3 and 4	2021	PUR	Rule Change Proposal for 2021 approved by BSC
8	Move <i>Salvia hispanica</i> from Table 2C Part 3 to Table 2C Part 1	2021		Rule Change Proposal for 2021 approved by BSC

B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
	Publication title	proposed	collaboration	remarks
		finalisation		update
				progress
1	ISTA Handbook on Seed Sampling	2021	ISTA Accreditation Department	Submitted to ISTA for distribution as electronic copy, waiting for verification by Editor
<u>B2. Training publications on specific seed testing topics</u>				
	Publication title	proposed	collaboration	Remarks
		finalisation		Update
				Progress
1	Supporting material for 'Train the trainers'	2022		Discussion will start after finalisation of Handbook
2	Supporting material for 'Train the trainers' – video clips	2023		Will continue when COVID-19 travel restrictions allow
3	Develop new video clips for sampling and sample division	2023		Will commence when COVID-19 travel restrictions allow
<u>B3. Scientific information publications</u>				
	Publication title	proposed	collaboration	remarks
		finalisation		update
				progress
1				
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject	proposed	collaboration	remarks
	location	finalisation		update
				progress
1	ISTA Workshop on Seed Sampling and Quality Assurance in Sampling, Denmark	2021	DFL Seeds A/S, Denmark	In planning, may be moved to 2022 due to COVID-19 travel restrictions
	ISTA Workshop on Seed Sampling and Quality Assurance in Sampling, Oct 2021, Turkey	2021	VRSCC, Turkey	In planning
D. Proficiency Tests				
	Proficiency Test Subject	proposed	collaboration	remarks
		finalisation		update
				progress
1.				
E. SPECIAL PROJECTS				
	project title / subject	proposed	collaboration	remarks
	collaborating committees	finalisation		update
				progress
1	Supporting material for 'Train the trainers' – further development of video clips	2023	ECOM, MOI	7 videos posted for public use on ISTA YouTube. Several new videos planned
2	Q & A Webpage	2023	SEC	In progress, waiting for Secretariat
3	Translation of Application for Seed Sampling Calculations (2nd phase)	2023		App now available in addition to English, in Afrikaans, Danish, Dutch, French, Italian, Portuguese, Russian, Spanish, Swedish and Turkish, link posted on ISTA Website. Waiting for translations by volunteers for 7 more languages.

			Further developments and enhancements to the App will continue.
F. QUESTIONS TO THE COMMITTEE			
	subject of question		from country
1	Lots with varying container size - heterogeneous		USA
2	Calculation of sampling intensity small 1 ton bags - examples		South Africa
3	Panicum maximum not in Table 2C anymore - name change		South Africa
4	Calculation of sampling intensity small containers - examples		South Africa
5	Number of times to test to verify divider is not working correctly		Philippines
6	Video on mixing - procedures		USA
7	Max seed lot size for new species <i>Chenopodium quinoa</i>		USA
8	Change max seed lot size for <i>Salvia hispanica</i> (Rule Change Proposal for 2021)		USA
9	Must Authorised Samplers attend training every year? - Depends on QM		Turkey
10	Frequency of divider testing		France
11	Sealing of lot after sampling		USA
12	Sampling App		Unknown
13	Question from lab on OIC validity, new ID Number, seed treated after sampling		ISTA Lab via ISTA Accreditation Department
14	Suitability of a specific automatic sampler.		ISTA Lab via ISTA Accreditation Department
15	Minimum samples sizes expensive seeds		Slovenia
16	Approval of big seed lots		Chile
17	2 OICs for same seed lot marked with different variety name and weights, not allowed.		ISTA Lab via ISTA Accreditation Department
18	Suitability of an automatic sample mounted in outlet (used for grain) - NOT suitable for seed		Canada
19	Submitted sample smaller than prescribed		Belgium
20	How to verify the authenticity of a label - contact the NDA		Iran
21	Sample size of Cowpeas of different lot sizes (remains the same) -via sampling calculator		CGIAR
22	Sample size for seed health , how many needed for disease testing - refer to specific seed health test on ISTA Website		CGIAR
23	Issuing of new OIC with added lot-number under 'as stated by applicant'.		Italy

24	New type of divider, discussed in BSC, agree that it conforms to rotary divider description, approve but need to be verified (NOT validated)	Hungary
25	Sampling of lots of 1000 x 4 seeds (0.098kg)	India
26	Suitability of long Nobbe trier for oats & Lolium	Uruguay
27	lab reported <i>Gossypium</i> spp. as <i>Gossypium hirsutum</i> , is this allowed? Yes.	ISTA Accreditation Department
28	Sampling small seed lots	Argentina
29	Reference to calculation of number of primary samples (Refer to ISTA Rules 2.5.1.2)	Egypt
30	Sampling seed mixtures, some constituent lots coated, others not	Argentina
31	Why Sampling Calculator stops at 42 000 kg (Grain trader) - explained.	Australia
32	Duplicate OICs, Sub-lot Certificates	South Africa
33	Nobbe trier - picture, comply or not?	Denmark
34	Use of 'OR' & 'AND' in Rules 2.2.12 and 2.2.13 (Definition of Treated and Coated seed – Rule Change Proposal for 2021)	Argentina
35	Different size containers in seed lots (for local use)	Egypt
36	Sampling of small containers (tins/packets)	Iran
37	Use of ISST (Sampling Template)	Iran
38	Testing of small lots (10kg) for research - give back seed after testing	Brazil
39	If Sampling stick (sleeve type trier) with certain dimensions are acceptable	Netherlands
40	Sampling App, calculation of primary samples on small containers and less than 15 containers	Switzerland
41	Why Chapter 2 does not make provision for sampling of mixtures, only BIC	Argentina
42	Seed sampling equipment for 100kg bags	Tanzania
43	Sampling of coated seed - how to ensure enough seed is submitted.	Iran
44	Hand halving only method for Chloris?	Argentina

 New project
 New proposed finalisation date

3. FSC Flower Seed Committee

COMMITTEE MEMBERSHIP LIST				
		Country		change comments
1	Rita Zecchinelli (Chair)	Italy		
2	Sarah Dammen (Vice Chair)	USA		
3	Rachael Davies	United Kingdom		
4	Meriam Dekalo Karen	Israel		
5	Alice Di Sacco	United Kingdom		
6	Sylvie Ducournau	France		
7	Erik van Egmond	Netherlands		
8	Stefanie Kramer	Germany		
9	Maria Marin	Croatia		
10	Lucele Pretorius	South Africa		
11	Zita Ripka	Hungary		
12	Soo-Young KIM	South Korea		
13	Shizka Takeuchi	Japan		
14				
15				
A. RULES DEVELOPMENT				
<u>A1. Introduction of New Methods</u>				
	Method name	proposed	collaboration	remarks update
	subject	finalisation		progress
1	<i>Eustoma exaltatum</i> : new germination method	2020	GER	Finalized. Rules change proposal submitted (S. Takeuchi, R. Zecchinelli)
2				
<u>A2. Introduction of New Species</u>				
	Species and test	proposed	collaboration	remarks update
		finalisation		progress
1	<i>Passiflora edulis</i>	2021	GER	To be started (s. Ducournau)
2				
3				
<u>A3. Introduction of Rules Changes</u>				
	Subject	proposed	collaboration	remarks update
		finalisation		progress
1	Sample size for flower species (Table 2A part 3)	2021	BSC	Data collection in progress. Not easy.

				(R. Zecchinelli)
2	Clarification about OSD for species listed in Table 2A, part 3	2020	BSC	To be started (R. Zecchinelli)
3				
B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
	Publication title	proposed finalisation	collaboration	remarks update progress
1	ISTA Handbook on Flower Seed Testing: new sheets			ISTA Flower Seed Testing Handbook - 2 nd Edition 2020 (electronic format) released (Z. Ripka)
2				
3				
<u>B2. Training publications on specific seed testing topics</u>				
	Publication title	proposed finalisation	collaboration	remarks update progress
1	Collaboration in the project of the website TSWS (Testing Seeds of Wild Species): wild flower species		WS	In progress (R. Davies)
2				
3				
<u>B3. Scientific information publications</u>				
	Publication title	proposed finalisation	collaboration	remarks update progress
1				
2				
3				
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject location	proposed finalisation	collaboration	remarks update progress
1	ISTA Workshop on Tetrazolium Testing and Equilibrium relative humidity (ERH) determination for Wild Species and Flowers	2021?	TEZ, MOI	Postponed due to Covid-19 pandemic (S. Kramer, M. Marin, R. Zecchinelli)
2				
3				
<u>C2. Seminars</u>				
	Seminar subject location	proposed finalisation	collaboration	remarks update progress
1				
2				

3				
D. Proficiency Tests				
Proficiency Test Subject		proposed	collaboration	remarks update
		finalisation		progress
1	ISTA PT 20-3 <i>Felicia heterophylla</i>	2020	PTC	Samples distributed (Z. Ripka)
2				
3				
F. SPECIAL PROJECTS				
project title / subject		proposed	collaboration	remarks update
collaborating committees		finalisation		progress
1	Participation in the preparation of the exercise on seed mixture (distribute with PT samples)	2019-22	PUR -PTC	Ongoing (S. Takeuchi)
2	Collaboration with AOSA: comparison of species listed in AOSA and ISTA Rules	2022	AOSA	To be started (S. Dammen)
3	Collection of information about Flower seed Testing by ISTA laboratories	2022		To be started
4	Inventory of TZ methods used by the laboratory for flower species	2022	TEZ	To be started (S. Kramer, R. Zecchinelli)
E. QUESTIONS TO THE COMMITTEE				
subject of question				from
				Country
1	Inclusion of <i>Malva</i> spp. in the ISTA Rules tables			ISTA Secretariat
2	Flower crop group (in relation to accreditation scope)			ISTA Accreditation Department
3	Germination of <i>Begonia</i> spp.			USA
	New project			
	New proposed finalisation date			

4. FTS Forest Tree and Shrub Seed Committee

COMMITTEE MEMBERSHIP LIST				
			change comments	
1	Chair: Elisa Vieira	Brazil		
2	Vice-Chair: Viktor Vankus	USA		
3	Magdalena Beza	Poland		
4	Lena Bezděčková	Czech Republic		
5	Valerie Blouin	France		
6	Marija Gradecki-Postenjak	Croatia		
7	Dave Kolotelo	Canada		
8	Isolde Dorothea Kossmann Ferraz	Brazil		
9	Stefanie Krämer	Germany		
10	Shelagh McCartan	United Kingdom		
11	Heidi Røsok Bye	Norway		
12	Edoardo Vincenti	United Kingdom		
13	Chandrashekara Vokkaliga Devegowda	India		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods				
			remarks	
Method name	proposed	collaboration	update	
subject	finalisation		progress	
1	Introduction of Agar substrate for <i>Pinus</i>	2021	GER	This work was completed by David Johnston. This method validation has been submitted as Rules Proposal.
2	Validation of germination test for <i>Jatropha curcas</i>	2022		Leader: Elisa Vieira Embrapa Agroenergy will provide the seeds. Dave Kolotelo and Valerie Blouin will participate of the tests.
A2. Introduction of New Species				
			remarks	
Species and test	proposed	collaboration	update	
None	finalisation		progress	
A3. Introduction of Rules Changes				
			remarks	
Subject	proposed	collaboration	update	
None	finalisation		progress	
B. PUBLICATIONS				
B1. Publications to accompany the Rules				
			remarks	
Publication title	proposed	collaboration	update	
	finalisation		progress	

2	None			
B3. Scientific information publications				
				remarks
Publication title	proposed	collaboration		update
	finalisation			progress
None				
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				remarks
workshop subject	proposed	collaboration		update
location	finalisation			progress
None				
C2. Seminars				
				remarks
Seminar subject	proposed	collaboration		update
location	finalisation			progress
None				
D. PROFICIENCY TESTS				
Proficiency test subject	proposed	collaboration		update
location	finalisation			progress
None				
E. SPECIAL PROJECTS				
project title / subject				remarks
collaborating committees	proposed	collaboration		update
	finalisation			progress
None				
F. QUESTIONS TO THE COMMITTEE				
				from
subject of question				country
Methods for <i>Moringa oleifera</i> germination test validation				Gillian Musgrove - Scotland
Use of coco peat as a substrate for neem seed germination				Chandrashekara Vokkaliga Devegowda - India
G: Further Comments - Responsibilities				
<u>leader of working groups</u>				

- New project
- New proposed finalisation date

5. GER Germination Committee

COMMITTEE MEMBERSHIP LIST				
				change comments
1	CHAIR: Gillian Musgrove	United Kingdom		
2	VICE-CHAIR: David Johnston	United States of America		
3	Pernilla Andersson	Sweden		Left Committee October 2020
4	Ignacio Aranciaga	Argentina		
5	Sarah Dammen	United States of America		
6	Lucile Daron	France		
7	Meriam Dekalo Keren	Israel		
8	Sylvie Ducournau	France		
9	Hortense Faucher	France		
10	Lesly Gonzalez Galaz	Chile		
11	Aidin Hamidi	Iran		
12	Andrea Jonitz	Germany		
13	Augusto Martinelli	Argentina		
14	Rita Zecchinelli	Italy		
15	Dot Vittrup Pedersen	Denmark		
16	Janek Bartel	Canada		
17	Erik van Egmond	Netherlands		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods				
				remarks
	Method name	proposed	collaboration	update
	subject	finalisation		progress
1	Introduction of agar substrate for <i>Pinus</i>	2020	FTS	This work was completed by David Johnston. This method validation has been submitted as Rules Proposal.
2	Addition of 20°C for <i>Anethum graveolens</i> germination	2021		This work is in early progress and is being carried out by Lucie Robineau (GEVES-SNES, France). Further seed lots are requested.
3	Using BP instead of TP for the germination of <i>Spartium junceum</i> .	2021	FTS	The work is carried out by David Johnston. The objective is to propose the BP substrate for the germination of <i>Spartium junceum</i> , instead of TP.

4	Addition of CCP for Glycine max	2020		The work was completed by Sarah Dammen and David Johnston. This method validation has been submitted as Rules Proposal.
5	Addition of 20°C for <i>Eustoma exaltum</i> germination	2020	FSC	This work was completed by Rita Zecchinelli and Shizka Takeuchi. This method validation has been submitted as Rules Proposal.
6	Addition of 20°C for <i>Papaver somniferum</i> .	2021	FSC	The test plan is being reviewed. The work is organised by Vladislava Gregorová, CZ. This work has been on hold due to COVID-19.
8	Addition of dormancy breaking methods for <i>Cannabis sativa</i> (hemp)	2021	AOSA/SCS Tand CFIA	This work is at an early stage and will be taken forward by Ruoqing Wang.
<u>A2. Introduction of New Species</u>				
				remarks
	Species and test	proposed	collaboration	update
		Finalisation		progress
1	Introduction of a germination method for <i>Chenopodium quinoa</i>	2020	STA, BSC, PUR	This work was completed by Lesly Gonzalez Galaz and Ignacio Aranciaga. This method validation has been submitted as Rules Proposal.
2	Introduction of a germination method for <i>Jatropha curcas</i>	2021	FTS	The study will be carried out by Elisa Vieira, Brazil from FTS committee.
3	Introduction of a germination method for <i>Cleome gynandra</i>	TBC	STA, BSC, PUR	The working group leaders are Lea Mazor and Meriam Dekalo-Keren. No work has started on the study. There is a germination method already for <i>Cleome hassleriana</i> so it may be possible to have a peer validation study performed.
4	Introduction of a germination method for Dwarf Saltwort (<i>Salicornia bigelovii</i> Torr. and <i>Salicornia persicum</i>)	2021	STA, BSC, PUR	The study is carried out by Aidin Hamidi. A preliminary study has been set up to find the best germination conditions for 3 Dwarf Saltwort species (<i>Salicornia bigelovii</i> Torr., <i>S. persicum</i> and <i>Salicornia perspolitana</i>). The germination tests were conducted by planting seeds as TP and BP during 7, 14 and 28 days, at 20, 25, 30 and 35 °C constant temps. and 20-30 and 20-35 °C alternative temperatures. The light requirement has also been tested.



				The best methods have to be selected for the validation study.
5	Introduction of a germination method for <i>Azadirachta indica</i>	TBD	FTS	The study is carried out by FTS.
6	Introduction of a germination method for Saatar (<i>Zataria multiflora</i> Boiss.) and Camelthorn (<i>Alhagi camelorum</i> F.).	2021		This study is carried out by Aidin Hamidi.
A3. Introduction of Rules Changes				
				remarks
	Subject	proposed	collaboration	update
		Finalisation		progress
1	Pre-washing of <i>Beta</i> seeds	2021	RUL	A method validation study will be led by Lesly Gonzalez Galaz, Chile.
B2. Training publications on specific seed testing topics				
				remarks
	Publication title	proposed	collaboration	update
		Finalisation		progress
1	ISTA Handbook of Seedling Evaluation (Spanish Version)	2021	Secretariat	The handbook has been translated into Spanish and will now be proof-read by Augusto Martinelli.
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	ISTA Workshop Purity & Germination - Ukraine	TBD	PUR	The lecturers are appointed and programme in place. Delayed from May 2020 due to COVID-19.
2	ISTA Workshop on Germination,	TBD	TZ VIG	The lecturers are appointed and programme in place. Delayed from March 2020 due to COVID-19.

	Tetrazolium & Vigour – Izmer, Turkey			
3	ISTA Workshop on Germination & Tetrazolium - New Zealand	TBD	TZ	No further update. Delayed due to COVID-19.
4	ISTA Workshop Purity & Germination – Ankara, Turkey	TBD	PUR	The lecturers are appointed and programme in place. Delayed from May 2021 due to COVID-19.
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
1	20-1 <i>Phaseolus vulgaris</i>	2020	PTC	Completed (delay in sending out due to COVID-19)
2	20-2 <i>Allium porrum</i>	2020	PTC	Completed
3	20-3 <i>Festuca pratensis</i> 20-3 <i>Felecia</i> sp.	2021	PTC FSC	Delayed due to COVID-19. Currently in progress
E. SPECIAL PROJECTS				
	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
1	Maize root system evaluation – Study of the definition of the minimum number of secondary roots necessary to compensate a defective primary root	2021		This study is carried out by Aidin Hamidi. The objective is to evaluate the influence of the secondary roots (number and development) on the normal Maize seedling evaluation The proposed experiment is: - The selection of seed samples from various varieties - The germination of the seeds in laboratory and, at the end of the test, the selection of seedlings with 1) well developed primary root, 2) defective primary root with different number and development of secondary roots - The transplanting of the developed seedlings into the field to evaluate the plant growth in crop conditions
3	Assessment on available technologies of imaging and image analysis for other seeds determination (OSD), purity analysis and germination.	2021	ATC PUR	Two surveys have been prepared, one for laboratories and one for the technology providers. The information collected will only be used for research purposes aimed at: - Promoting technology development in the application used for seed testing. - Analysing and identifying potential solutions and strategies for the speedy application of advanced technology in seed testing. - Providing information to assist laboratories in making informed decisions on whether to use imaging and AI technologies in seed testing.

4	Radicle emergence and conductivity tests as potential methods to predict normal germination in five vegetable Brassic species.	2021	VIG	<p>The aim of the project is to investigate the potential for a single count of radicle emergence and / or an assessment of seed leachate conductivity to predict differences in germination and seed vigour. The possible use of automated counts of radicle emergence using image analysis (MSI and RGB) is a further aim.</p> <p>RE counts have been identified to be predictive of germination and seed vigour in Brassica species. Comparative tests are planned in 2021 to validate some of these early counts.</p>
6	Comparison of the temperature regimes for the germination of <i>Beta vulgaris</i> (pelleted and non-pelleted).	2020	PTC Secretariat	<p>This work was completed by Sylvie Ducournau.</p> <p>The report will be published in Seed Testing International, April 2021.</p>
F. QUESTIONS TO THE COMMITTEE				
	subject of question			from
				Country
1	Duration of a germination test for reporting on an OIC			Denmark
2	Pre-heating of seeds for dormancy breaking			New Zealand
3	Pre-washing of <i>Beta</i> spp.			Switzerland
4	Testing of <i>Solanum tuberosum</i>			Kosovo
5	Temperature checking of equipment (frequency)			South Korea
6	Harmonisation of AOSA and ISTA Rules			USA
7	Health and Safety of treated seed			France
8	Use of Organic Growing Media			Poland
9	General ISTA germination testing			Japan
10	Use of TPS in the germination test			Netherlands
11	Germination method for <i>Eragrostis</i> spp.			South Africa
12	Quantity of seed required for germination test (small seed lot)			Slovenia
13	Validity of OIC requirements			Italy

14	Technical issue regarding Interactive ISTA Certificate			Switzerland
15	Lux reading requirements for germination equipment			New Zealand
16	Germination method for <i>Chenopodium quinoa</i>			Switzerland
17	Germination method for <i>Brassica napus</i>			Japan
18	Vacuum planting systems			Chile
19	Reporting of fresh seed in certain species			Switzerland
20	Reporting a germination result early on an OIC			Denmark
21	Germination method for <i>Brassica napus</i>			Zambia
22	Germination method and reporting of <i>Solanum lycopersicum</i>			Turkey
23	Germination method for <i>Glycine max</i>			Poland
24	The use of N when reporting a germination result on an OIC			South Africa
25	Germination method for <i>Triosanthes cucumerina</i>			Japan
26	Reporting multigermin units on ISTA Certificates			Switzerland
27	Potential of using wool mulch for germination testing			India
28	Proposal for a method validation study for <i>Moringa oleifera</i>			India/New Zealand
29	Temperature requirements for <i>Crataegus monogyna</i> germination			Ireland
30	Reporting germination results on a BIC			Japan
31	Germination issues with <i>Carica papaya</i>			Japan
32	Germination issues with <i>Raphanus sativus</i>			New Zealand
33	Germination testing on a granulated seed mixture			Switzerland
34	Germination of coated seeds			Brazil
35	Tetrazolium testing at the end of a germination test			South Africa

36	Seedling evaluation of <i>Hordeum vulgare</i>			India
37	Seedling evaluation of <i>Lupinus</i> spp.			Australia
38	Dormancy breaking of grasses			South Africa
39	Seedling evaluation of <i>Hordeum vulgare</i>			Canada
40	Seedling evaluation of <i>Hordeum vulgare</i>			India
41	Seedling evaluation of <i>Hordeum vulgare</i>			South Korea
42	Suggestion to produce new seedling images			Switzerland
43	Reporting germination results on an OIC			Switzerland
44	Pure seed requirements for germination testing			France
45	Pre-treatments used for <i>Lolium</i> spp.			Argentina
45	Germination testing for <i>Chloris gayana</i>			Argentina

	New project
	New proposed finalisation date

6. GMO Committee

COMMITTEE MEMBERSHIP LIST			
		Country	
1	CHAIR: Enrico Noli	Italy	
2	VICE-CHAIR: René Mathis	France	
3	Elizabeth Bates	Belgium	
4	Sofia Ben Tahar	France	
5	Tajinder Grewal	Canada	
6	Lutz Grohmann	Germany	
7	Andrea Jonitz	Germany	
8	Jean-Louis Laffont	France	
9	Dwarkesh Parihar	India	
10	Elena Perri	Italy	
11	Kirk Remund	United States	
12	Ana Laura Vicario	Argentina	
13	Bruno Zaccomer	France	
14	Dabing Zhang	China	
15	Ray Shillito	United States	
A. RULES DEVELOPMENT			
<u>A1. Introduction of New Methods</u>			
<u>A2. Introduction of New Species</u>			
<u>A3. Introduction of Rules Changes</u>			
Subject		proposed	collaboration
		finalisation	
	<i>Changes reflecting new definitions currently being introduced in the Handbook on GMO testing</i>	2021	
B. PUBLICATIONS			
<u>B1. Publications to accompany the Rules</u>			
Publication title		proposed	collaboration
		finalisation	
	<i>GMO Testing Handbook</i> (R. Mathis and E. Noli WG Leads) <i>Finalised Chapter 5 – Statistical part (article on Seed Testing International No. 160, October 2020). Some progress made in 2020 in other Chapters.</i>	2021	STA, VAR, Audit team at Secretariat
<u>B3. Scientific information publications</u>			
Publication title		proposed	collaboration
		finalisation	
	Publish articles on activity of the committee (B. Zaccomer WG Lead) <i>Designing GMO testing plans and analyzing associated results. K.</i>	Ongoing	

<i>Remund, E. Noli , E. Bates, E. Perri, C. Haldemann, R. Mathis, B. Zaccomer, J-L. Laffont. Seed Testing International No. 160, October 2020</i>		
C. WORKSHOPS AND SEMINARS		
<u>C1. Training and education workshops</u>		
workshop subject	proposed	collaboration
Location	finalisation	
<i>No training workshops this year</i>		
D. Proficiency Tests -		
Proficiency Test Subject	proposed	collaboration
	finalisation	
<i>December 2019</i>		<i>STA, Secretariat</i>
PT23 – Soybean <i>Material for PT was finally found, Material Transfer Agreement with Seed Provider under way, next PT Announcement. Running of this PT was delayed by difficulties in finding suitable seed material with appropriate documentation in face of phytosanitary regulations worldwide. Some adjustments at the existing procedures for GMO PT organisation turned out necessary to meet stewardship requirements of Seed Provider.</i>	<i>2021</i>	
PT24 – Maize: <i>In early stages of preparation – planning with Industry.</i> PT24 – Cotton: <i>In early stages of preparation – planning with Industry.</i>	<i>2022 2022</i>	
E. Questions to the Committee - Since date of last report		
Question subject	Date	From
		(Country)
<i>No questions to the Committee</i>		
F. SPECIAL PROJECTS		
project title / subject	proposed	collaboration
collaborating committees	finalisation	
3 ISTA GMO Website: <i>(E. Bates, WG Lead)</i> <i>No updates</i>	<i>Ongoing</i>	<i>Secretariat</i>
4 ATC Contact: <i>(A. L. Vicario)</i> <i>No updates</i>	<i>Ongoing</i>	<i>Advanced Technology Com.</i>
5 Statistical tools for GMO Testing: <i>(J.-L. Laffont, WG Lead)</i> <i>Since October 2019 ISTA was established as a type A liaison within ISO Technical Committee 34 "Food products", Subcommittee 16 "Horizontal methods for molecular biomarker analysis" Working Group 9 "Seed and grain subsampling". Three ISTA GMO members have contributed to the work for the production of a new ISO Standard on group testing for GMO bringing the ISTA expertise.</i>	<i>Ongoing</i>	<i>STA</i>

6	<p>WG on Standardized Terms (E Noli, WG Lead)</p> <p><i>WG has further reviewed the list of standard terms used in GMO testing. A draft version of standard terms for GMOs in maize, soybean and canola based on Biosafety Clearing House and Eugenius database was prepared. This shall be associated with adjustments in the GMO database at the ISTA Secretariat which allows the management of laboratory accreditation and auditing, and their participation to the Proficiency Test Program. The work is proceeding in connection with the preparation of the GMO Testing Handbook and will improve the description of the accreditation process.</i></p>	<p>Ongoing 2021</p>	<p>Audit Team and TCom Manager at Secretariat</p>

7. MOI Seed Moisture Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	CHAIR: Axel Goeritz	Germany	chair since 4-2020
2	Jette Nydam	Denmark	
3	Gerarda de Boer-Raatgever	Netherlands	
4	Sergio Pasquini	Italy	
5	Susan Alvarez	United States	
6	Baymolo Goma	Zambia	
7	Wen-Ju Yang	Separate Customs Territory of Taiwan	
8	Celine Herbert	France	
9	Fiona Hay	Denmark	Joined June 2020
10	Tanja Petrovic	Serbia	
11	Selma Kurt	Turkey	Joined December 2019
12	Ramesh D M	India	Joined October 2020
13			
14			
15			
A. RULES DEVELOPMENT			
<u>A1. Introduction of New Methods</u>			
			remarks
	Method name	proposed	collaboration
	subject	finalisation	update
			progress
1	Use of equilibrium Relative Humidity (eRH) as an alternative method for the determination of seed moisture status	2022	FTS, STA
			<p>Questionnaires sent out to ISTA laboratories to gather information on how much use of this method is already made and on current methods used (53 responses). The majority of respondents were in favour of adding eRH to the rules.</p> <p>Comparative testing with various species was planned for 2020 but didn't take place. The use of eRH for testing of coated seeds to be investigated.</p> <p>The funding of a special eRH-project will be applied in 2021.</p>
<u>A2. Introduction of New Species</u>			
			remarks
	Species and test	proposed	collaboration
		finalisation	update
			progress
1	<i>xFestulolium</i>	2021	STA
			Data re-analysed and Method Validation Report revised. Rules

				change proposal is planned to be prepared for 2021.
2	<i>Carica papaya</i>	2020		Method Validation Report produced. Rules change proposal prepared and voted for in 2020.
3	<i>Helianthus annuus</i>	2021		Adina Tirziu from the Central Laboratory for Quality of Seeds and Planting Material in Romania will lead this work. Proposal for a comparative test currently being prepared.
A3. Introduction of Rules Changes				
				remarks
	Subject	proposed	collaboration	update
		finalisation		progress
1	Checking the need for grinding of small species with hard seeds - <i>Medicago sativa</i> , <i>Lotus pedunculatus</i> , <i>Lotus corniculatus</i> , <i>Trifolium pratense</i> , <i>Trifolium repens</i> ,	2021	STA	This work has not yet conducted due to staffing issues but is planned to progress in 2021.
B. PUBLICATIONS				
B1. Publications to accompany the Rules				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	Review and update Handbook on Moisture Determination	2022	Secretariat	Lead is named and chapters to work on are given to resp. members
B3. Scientific information publications				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	Excel tool for calculation of moisture test results	2020		Tool is published on the website.
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress

1	Workshop on Moisture Testing	March 2020		Two day workshop with a focus on the oven method for seed moisture testing was planned, but didn't take place
2	Workshop on tetrazolium testing and equilibrium relative humidity determination for wild and flower species	May 2020		Fiona Hay will give the lectures/practical demonstrations on eRH as part of this workshop. This workshop was cancelled.

D. PROFICIENCY TESTS

	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
1				

E. QUESTIONS TO THE COMMITTEE

	subject of question	Month		from
				country
1	Correct moisture estimation procedure for Pennisetum glaucum	Apr 2020		India
2	Moisture Test on Eragrostis spp.	May 2020		South Africa
3	Moisture Test on Seed mixtures	Jun 2020		ISTA Secretariat
4	Moisture Test on lentils	Aug 2020		Finland
5	Determination of Moisture contend in coated seeds	Nov 2020		Argentina
6	There are results of a comparison of high and low temperature method in Raphanus sativus. Is it possible, to take the high temp method?	Oct 2020		India
7	How to test Carthamus tinctorium?	Nov 2020		Moldova

8. NOM Nomenclature Committee

COMMITTEE MEMBERSHIP LIST				
				change comments

1	CHAIR: Melanie Schori	United States	
2	VICE-CHAIR: Ernest Allen	United States	
3	Susan Alvarez	United States	
4	Bernard Baum	Canada	
5	Michel Chauvet	France	
6	Axel Diederichsen	Canada	
7	Marco Hoffman	Netherlands	
8	John Wiersema	United States	
Dr. Tamara Smekalova died at the end of 2019, with the Committee informed in early January 2020.			
F. SPECIAL PROJECTS			
	project title / subject		remarks
	collaborating committees	proposed collaboration	update
		finalisation	progress
E. QUESTIONS TO THE COMMITTEE			
	subject of question	date	from
			country
1	Author names	January	New Zealand
2	Name changes in <i>ISTA List of Stabilized Plant Names</i>	January	France
3	Name changes in <i>ISTA List of Stabilized Plant Names</i>	January	Germany
4	Name changes in <i>ISTA List of Stabilized Plant Names</i>	January	Russia
5	Name changes in <i>ISTA List of Stabilized Plant Names</i>	January	Belgium
6	Name changes in <i>ISTA List of Stabilized Plant Names</i>	January	Finland
7	Name changes in <i>ISTA List of Stabilized Plant Names</i>	February	Hungary
8	Name changes in <i>ISTA List of Stabilized Plant Names</i>	February	Belgium

Activity Report of the ISTA Committees 2020

9	Species names not in ISTA but in laboratory's database	February		Belgium
10	Stabilised List in shorter form for printing	February		United States
11	Stabilised List in form other than PDF	April		South Africa
12	Updates to ISTA Universal List	April		Canada
13	Rules corrections	May		United States
14	Synonyms on certificates	June		Japan
15	Identification to rank below species	July		France
16	Synonyms on certificates	September		Brazil
17	Inclusion of <i>Geranium pusillum</i> in Stabilised List	November		Sweden
18	Identification to rank below species	December		Belgium
	New project			
	New proposed finalisation date			

9. PUR Purity Committee

COMMITTEE MEMBERSHIP LIST (2019-2022)			
	Members	Country	Membership since
1	CHAIR: Ruoqing Wang	Canada	2009
2	VICE-CHAIR: Andrea Jonitz	Germany	2010
3	Augusto Martinelli	Argentina	2007
4	Aurelie Charrier	France	2018
5	Axel Goeritz	Germany	2017
6	Carrie Lewis	United States	2016
7	Deborah Meyer	United States	1995
8	Dot Vittrup Pedersen	Denmark	2013
9	Sue Cousins	New-Zealand k	2017
10	Kepha Oganda	Kenya	NA
11	Maria Duter	New Zealand	2011
12	Selma Kurt	Turkey	2016
13	E. (Erik) van Egmond	Netherlands	2019
14	Mary Reid	U.K	2019
15			

A. RULES DEVELOPMENT

A1. Introduction of New Methods

	Method name	proposed/finalized	collaboration	Remarks/ update/ progress
	No new method was introduced in 2020			

A2. Introduction of New Species

	Species and tests	proposed/finalized	collaboration	remarks /update /progress
	No new species was introduced in 2020.			
1.	New species application to be introduced into ISTA Rules	In the work plan		Project lead assigned

A3. Introduction of Rules Changes

	Subject	proposed/finalized	collaboration	Remarks/ update /progress

1	C.1.5.2.2 Revision C.1.5.2.4 Revision	proposed	Nomenclature Accreditation	Submitted to RUL committee
2	C.3.1. Revised definition Inert matter	proposed		Submitted to RUL committee
3	C.4.2.4. PSD 23	proposed		Submitted to RUL committee
4	3.8 Table 3B part 1 and 2 Editorial corrections	proposed		Submitted to RUL committee
5	3.2.4 Soil Percentage Test	In development		To be proposed in 2021
6	C.3.5.2. and 4.5.2 Retest sample storage	In development		To be proposed in 2021
7	C.3.7 Reporting on impurity retest	In development		To be proposed in 2021
8	2.5.4.5/4.2.4 Reduced test for small lot or expensive seeds	In the work plan		Project lead assigned
9	Revision Chapter 14: x- ray	In the work plan		Project lead assigned
10	Revision Chapter 11: Coated seeds	In the work plan		Project lead assigned

B. PUBLICATIONS

B1. Publications to accompany the Rules

	Publication title	proposed/finalized	collaboration	Remarks/ progress
1	PSD Handbook Revision	In the work plan		Project lead assigned

B2. Training publications on specific seed testing topics

	Publication title	proposed/finalized	collaboration	remarks/progress
1	Seed ID for tropical grass species and weeds	In progress	Dr. Doris Groth Myriam Alvisi	ISTA Secretariat to publish
2	Training materials for seed ID on the ISTA universal list	A project was approved	Flower committee	Project for 2021-2023
3	Publish an inventory of references of Seed ID	In the work plan		Project lead assigned
4	Publish FQA on ISTA website to the PUR committee	In the work plan		Project lead assigned
5	Standardization of training materials used in ISTA purity workshop	In the work plan		Project lead assigned

B3. Scientific information publications

	Publication title	proposed/ finalized	collaboration	remarks/ progress
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	ISTA-Project 19-1 progress report	published	ATC	Seed Testing International, Oct 2020, Page 40
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject/ location	proposed/finalization	collaboration	remarks/progress
1.	Workshop to Ukraine (English) is delayed due to Pandemic			Look into a virtual option?
2.	Workshop to Uruguay (Spanish) is delayed due to Pandemic			
D. PROFICIENCY TESTS				
	Proficiency test	proposed	collaboration	Remark/progress
1	Seed Mixture Round 8	2019	FSC/PTC	Netherland (: Gerarda de Boer – Raatgever) delivered
2	Seed Mixture for <i>Cuscuta</i> Round 9	2020	PTC	Delivered by Nicolae Elena from the lab of Romania Supported by Dot Vittrup Pedersen
3	Seed Mixture Round 10	2021	PTC	Germany (Axel Goeritz) will be delivered on the panel of PT 21-01

F. SPECIAL PROJECTS				
	Project title /subject	proposed/finalized	collaboration	Remarks/ update/ progress
	Assessment of available technologies of imaging and image analysis	2019-2021	ATC, GRM, participating institutes	Officially started in November 2019
	Look into ways of training in seed identification and practical purity work (e.g., web-seminars, instruction video, seed id websites)	2019-2021	ECOM	Work with ISTA ECOM initiatives on training

E. QUESTIONS TO THE COMMITTEE

	subject of question (see more details in PUR Teams)	date	country
1	Our lab always reports other seeds with the authors. For the companies the authors name of a species is not very relevant information. But maybe the nomenclature committee can answer that question.	6/Jan/20	Netherlands
2	<ol style="list-style-type: none"> 1. What should we do if the species is not in Table 2C (e.g., weed seed)? 2. We also put some species that are regulated by our law to „Other determinations “section. Should we apply these forms of names to this section too? 3. Is it still ok to state <i>Rumex</i> sp. of the species <i>R. crispus</i>/<i>R. obtusifolius</i>? 	10/Jan/20	Czech Republic
3	How much is the working sample for Determination of number of other seeds in coated seeds"? This is 100 pellets or as described in column 3 of Table 11 A and B. Because in Determination of number of other seeds test, other species were separated so!	15/Jan/20	Iran
4	Information on seed collection vendors	21/Jan/20	Brazil
5	Are the spores of Ferns inert matter, like we do with sclerotinia spores of fungi. Or are they other seeds?	2020-03-28	Netherlands
6	Could you please give us some piece of advice regarding the Rules (when we should use it etc.)?	2020-04-20	Czech Republic
7	Which method should I use if I need to determine TSW for rapeseed in pesticide efficacy field trials? We have oilseed rape sample about 700 gram and an automatic seed counter.	8/May/20	Latvian
8	Which statistics tool are you using if we have 5 results from 5 different laboratories and we want to see if all results are within tolerance?	11/May/20	Denmark
9	Seed ID assistance on <i>Poa secunda</i>	15/May/20	Germany
10	5.2.9 Multigerm seed units Several types of seed units can produce more than one seedling. If a unit produces more than one normal seedling, only one is counted for determining the germination percentage. Does this rule contradict the rule?	25/May/20	GER committee
11	Coated seed: To calculate the Submitted and working sample weight I use the Thousand seed weight calculation (Chapter 10) to ensure that the sample size is compliant	8/Jul/20	South Africa
12	How to report two tests of impurities in purity analysis?	5/Aug/20	Slovenia
13	Chapter 16 Rule for Size and Grading: "Are there any advice/recommendations given by ISTA on the control of the round-hole screens for size grading "	18/Sep/20	France
14	Retest sample storage	25/Sep/20	BSC Committee
15	PDS 28	30/Oct/20	Argentina
16	Chapter 3, Brassica Pure seed determination	19/Nov/20	Australia
17	Balance decimal place for Purity & OSD	3/Dec/20	Finland
18	Seed ID assistance	17/Dec/20	Netherlands

10. SHC Seed Health Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	CHAIR: Valerie Grimault	France	Chair
2	VICE-CHAIR: Terry Aveling	South Africa	Vice chair
3	Ilaria Alberti	Italy	
4	Rouke Bakker	New Zealand	
5	Mark Buimer	Netherlands	
6	Gary Munkvold	United States	
7	Rosa Piña González	Chile	Since June 2016
8	Dorota Szopinska	Poland	
9	Xiulan Xu	China	Since June 2017
10	Wen-Hsin Chung	Taiwan	Since June 2018
11	Stephan Brière	Canada	Since June 2018
12	Isabelle Serandat	France	Since June 2019
13	Marian Mc Ewan	United Kingdom	Since June 2019
14	Kohei Osaki	Japan	Since June 2019
15	Ruud Barnhoorn	Netherland	Since June 2019
A. RULES DEVELOPMENT			
<u>A1. Introduction of New Methods</u>			
			<u>remarks</u>
	Method name	proposed	collaboration
	subject	finalisation	update
			progress
1	<i>Fusarium graminearum</i> , <i>F. langsethiae</i> , <i>F. culmorum</i> , <i>F. poae</i> ... – Cereals new method	2013-2021	Nibio Norway Test plan finalized and sent to ISTA for review, based on plating on media and morphological identification, collection of isolates performed, analytical specificity under progress
2	<i>Fusarium oxysporum</i> on tomato – new method	2013-2021	Naktuinbouw, GEVES, Microlab New test plan finalized and sent to ISTA for review, dilution plating, PCR for identification and pathogenicity test confirmation
3	<i>Ascochyta rabieil</i> chickpea	2013-2021	GEVES Part of a research project at GEVES. Test plan finalized and sent to ISTA for review, based on plating on media and morphological identification, collection of isolates under progress
4	<i>Tilletia</i> species/wheat	2018-2022	GEVES Project to compare existing methods in order to select one to validate, questionnaire analyzed, meeting performed to discuss differences in methods. Test plan to compare parts of the methods under progress
5	<i>Pseudomonas syringae</i> pv. <i>glycinea</i>	2018-2023	USDA Project to compare existing methods in order to select one to validate
7	<i>Botrytis cinerea</i> on hemp seeds	2019-2023	CREA, GEVES New method development, test plan finalized, sent to ISTA for review
<u>A3. Introduction of Rules Changes</u>			
			<u>remarks</u>
	Subject	Proposed finalisation	collaboration
			Update progress

1	SHC XX: <i>U. nuda/Hordeum vulgare</i> , staining	2016-2021	SASA	Report finalized, sent to ISTA and reviewed, included in rules proposals for vote June 2021
2	PCR detection of <i>L. maculans</i>	2019-2023	Canadian Food Inspection Agency	Project phase
3	Five year Method reviews	2018-2019	Univ Pretoria	Questionnaire 2019 and 2020 will be grouped
4	<i>Ascochyta</i> pea comparing NUV/dark	2016-2022		Infected seeds to be found
	Editorial modifications for harmonisation hypochlorite	2019-2020	Dorota Szopinska	Proposed for rules proposals and voted May 2020
	Harmonisation wording for sample and subsample size	2019-2020	Rosa Pina, Dorota Szopinska	Proposed for rules proposals and voted May 2020
	Ethidium Bromide/Gel red/or equivalent	2019-2020	Rosa Pina	Proposed for rules proposals and voted May 2020
	Harmonization of pretreatment with hypochlorite	2019-2020	Ilaria Alberti, Kohei Osaki, Rosa Pina, Isabelle Serandat, Dorota Szopinska,	Experiments carried out, report finalized, proposed for rules proposals to be voted June 2021
B2. Training publications on specific seed testing topics				
				<u>remarks</u>
	Publication title	proposed	collaboration	update
1	Seed Health Handbook	2013-2021	Terry Aveling	12 chapters under review
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				<u>remarks</u>
	Workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	Seed Health Workshop Pretoria South Africa, Seed health methods using PCR, ELISA, dilution plating and indexing methods	2020	University Pretoria, Starke Ayres	Second announcement circulated, postponed to 2021
2	Online training project	2021-2022	All SHC	First meeting to define the concept and a preliminary program: general webinars and more specific ones for protocols with demonstrations
C2. Seminars				
				<u>remarks</u>
	Seminar subject	proposed	collaboration	update
	location	finalisation		progress
	ISTA Plant Health Seminar for International Year of Plan Health	2020	CREA	program finalized, postponed to 2021
	qPCR <i>Leptosphaeria maculans</i> + SH symposium	2021	Canadian Food Inspection Agency	Seed Health seminar and workshop, August 2021 Ottawa, Canada

D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
1	7-007 Three pathogens <i>Linum</i>	2016-2018	GEVES	Completed, report sent
2	7-028 Tobamoviruses	2020	GEVES	Under progress
3	7-029, <i>Pseudomonas syringae</i> pv. <i>pisi</i>	2021	Naktuinbouw	Planned 2021
4	7-031, <i>Ditylenchus dipsaci</i>	2020-2021	GEVES	Planned 2021
5	7-014, <i>Parastagonospora nodorum</i>	2019-2022	CREA	Planned 2022
6	7-022, <i>Microdochium nivale</i>	2019-2022	SASA	planned
7	7-006 <i>Colletotrichum lindemuthianum</i>	2019-2022	NARO	planned
F. SPECIAL PROJECTS				
	Project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
	ISTA Reference Pest List:	2018-2022	GEVES	10 crops published, New project on 34 crops under progress, 1 crop reviews received will be published end 2020 beginning 2021. Update of literature and taxonomy for 10 first crops finalized with information of pests which are regulated or not.
	Statistic tool	2019-2021	Statcom	Set up a tool on the model of the germination tool
	NSHS-ISTA collaboration	2020-2022	NSHS	Compare validation guidelines for mutual recognition
	Insect detection/identification project	2021-2022	ATC, ANSES-LSV	Review of existing methods and evaluation of these methods on selected insect/crop models to detection and identification of insects on and in seeds. Project submitted to ECOM and accepted, start January 2021
	New project			
	New proposed finalisation date			

11. STA Statistics Committee

COMMITTEE MEMBERSHIP LIST				
				change comments
1	CHAIR: Jean-Louis Laffont	France		
2	VICE-CHAIR: Kirk Remund	United States		
3	Gabriel Carré	France		
4	Mustapha El Yakhlifi	France		
5	Zhou Fang	United States		
6	Bonnie Hong	United States		
7	Winfried Jackisch	Germany		
8	Zivan Karaman	France		
9	Bo-Jein Kuo	Separate Custom Territory of Taiwan, Penghu, Kinmen and Matsu		
10	Ray Shillito	United States		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods/New Species				
				remarks
Method name	proposed	collaboration	update	
subject	finalisation		progress	
1	Statistical reviews of Test Plans and Validation Reports	On-going	Any TCOM	A total (introduction of new methods and introduction of new species) of 3 Validation Reports reviewed.
2	Contribution to the analysis of some Validation Studies	On-going	Any TCOM	Support provided to members on the use of the R Shiny package <i>ISTAgermMV</i> ; analysis of 4 Method Validation studies.
F. SPECIAL PROJECTS				
project title / subject				Remarks
collaborating committees		proposed	collaboration	Update
		finalisation		Progress
1	GMO Proficiency Tests	On-going	GMO	. Developed theoretical assessment of the purity of a mixture of k lots with same purity levels. . Contributed to the design of GM PT 23.
2	GMO Testing Handbook	2020	GMO	Published Chapter 5 (Designing GMO testing plans and analyzing associated results) in October 2020 issue of STI.
3	Contributions to the work of the ISO TC 34/SC 16, WG 9 on Group testing for Adventitious Presence testing	2021	GMO	. Formalized the statistical approach for estimating GMO purity through bioassays. . Started to work on a new theoretical framework for the estimation of the maximum group size from the minimum number of DNA copies per seed required in the DNA amount used in PCR.
4	GM trait percentage estimation using digital PCR (dPCR)	2021	GMO	Worked on the theoretical aspects of GM trait percentage estimation using digital PCR : development of new formulas for the bias and the variance of the dPCR estimator.
E. QUESTIONS TO THE COMMITTEE				

	subject of question	Date	From
1	Sampling	February	Canada
2	LOD, LOQ	February	Brazil
3	Analysis of Method Validation studies	February	USA
4	Germination Tolerance Calculator	April	USA
5	Analysis of Method Validation studies	May	Netherlands
6	Analysis of Method Validation studies	May	Canada
7	Coefficient of variation for germination Validation studies	May	Zambia
8	Analysis of Method Validation studies	October	Chile
9	Probability to find a given number of infected samples given a contamination rate	November	Switzerland
10	PT rating	December	France

12. STO Storage Committee

COMMITTEE MEMBERSHIP LIST			
		Country	Active since
1	Chair: Jayanthi Nadarajan	New Zealand	New 2019
2	Vice-Chair: David Mycock	RSA	
3	Cathy Offord	Australia	
4	Joseph Asomaning	Ghana	
5	Andreas Börner	Germany	
6	Isolde Dorothea Kossmann Ferraz	Brazil	
7	Steven Groot	Netherlands	
8	Frank Lanfermeijer	Netherlands	
9	Moctar Sacandé	Italy	
10	Sershen Naidoo	RSA	
11	Christina Walters	USA	
12	Xiang-Yun Yang	China	
13	Hugh W. Pritchard	UK	
14	G V Jagadish	India	New 2019
15	Radha Narayanaywamy	India	New 2019
	ECOM Liaison officer: Keshavulu Kunusoth		
A. RULES DEVELOPMENT		proposed	
A1. Introduction of new methods (innovation in seed storage)		finalisation	
A1.1. Combination of vacuum infiltration and droplet vitrification cryopreservation for recalcitrant seeds		2020	
<p>This new innovative technique has been tested on <i>Syzygium maire</i> (a critically threatened New Zealand Myrtaceae species). A publication was generated based on this study;</p> <ul style="list-style-type: none"> Karin van der Walt, Peter Kemp, Svetla Sofkova-Bobcheva, David Burritt and Jayanthi Nadarajan. 2020. Evaluation of droplet vitrification, vacuum infiltration vitrification and encapsulation-dehydration cryopreservation for <i>Syzygium maire</i> zygotic embryos. <i>Manuscript accepted for publication in CryoLetters</i> 2020. <p><i>Syzygium maire</i> is a threatened tree species with limited information on long-term seed storage options for its recalcitrant seed. This study investigated cryopreservation of <i>S. maire</i> zygotic embryos using dehydration, encapsulation-dehydration as well as PVS2 vitrification using droplet vitrification (DV) and the novel droplet vacuum infiltration vitrification (DVIV) methods. The effect of PVS2, using DV and DVIV, was assessed for various desiccation times and temperatures. Encapsulated embryos desiccated to 31% and 37% moisture content survived (greening of embryos and elongation of radicle) but no plantlets were formed following cryopreservation. Exposure to PVS2 using the DV method had a negative impact on embryo survival and plantlet formation, while DVIV resulted in improved vigour for non-cryopreserved embryos however, no survival was recorded for cryopreserved embryos. This study made a good progress in establishing vigorous embryos following cryoprotectant treatments which is a first hurdle for any woody plant tissue, the next step to improve the DVIV method for obtaining successful</p>		Target achieved	

survival and regeneration following cryopreservation is currently under investigation.		
B. PUBLICATIONS		
<u>B1. Publications of the seed storage handbook</u>		
	proposed	collaboration
	finalisation	
Handbook on Seed Storage	2022	
The storage handbook's chapters have been outlined and sent to committee members for confirmation of authorship in November 2020. Confirmation for authorship for most of the chapters has been received. A committee meeting will be held in January 2021 to initiate the drafting of these chapters.	On target	
<u>B2. Scientific information publications</u>		
Publication title	proposed	collaboration
	finalisation	
Target: 20 scientific publications (book chapters and journal articles, including in SS&T) on seed storage.	2022	
23 publications covering 21 peer reviewed journal publication, one newsletter article and one client report completed	Target achieved	
<ol style="list-style-type: none"> 1. Adeboye K, Börner A: Delayed luminescence of seeds: do shining seeds indicate viability? <i>Seed Sci. Technol.</i> 48 (2020) 167-177. doi.org/10.15258/sst.2020.48.2.04 2. Rehman Arif M A, Börner A: An SNP Based GWAS analysis of seed longevity in wheat. <i>Cereal Res. Commun.</i> 48 (2020) 149-156. dx.doi.org/10.1007/s42976-020-00028-x 3. Wiebach J, Nagel M, Börner A, Altmann T, Riewe D: Age-dependent loss of seed viability is associated with increased lipid oxidation and hydrolysis. <i>Plant Cell Environ.</i> 43 (2020) 303-314. dx.doi.org/10.1111/pce.13651 4. Safina G F, Novikova L Y, Lohwasser U, Börner A: The dynamics of seed longevity in winter wheat. <i>Ann. Wheat Newsl.</i> 66 (2020) 71-73. 5. Ballesteros D, Pritchard HW (2020) The cryobiotechnology of oaks: an integration of approaches for the long-term ex situ conservation of <i>Quercus</i> species. <i>Forests</i> 11, 1281; doi:10.3390/f11121281 6. Jaganathan GK, Dalrymple ES, Pritchard HW (2020). Seed survival at low temperatures: a potential selecting factor influencing community level changes in high altitudes under climate change. <i>Critical Reviews in Plant Sciences</i> https://doi.org/10.1080/07352689.2020.1848277. 		

7. Malik SK, Choudhary R, Kaur S, Chaudhury R, Pritchard HW (2020) Storage behavior and cryopreservation of *Citrus cavaleriei*, an endangered, cold-resistant species of northeast India with exceptionally large seeds. *CryoLetters* 41 (5), 281-290.
8. Pence VC, Ballesteros D, Walters C, Reed BM, Philpott M. Dixon KW, Pritchard HW, Culley TM Vanhove A-C (2020). Cryobiotechnologies: Tools for expanding ex situ conservation to all plant species. *Biological Conservation*
<https://doi.org/10.1016/j.biocon.2020.108736>
9. Ballesteros D, Pritchard HW, Walters C (2020). Dry architecture - Towards an understanding of the variation of longevity in desiccation-tolerant germplasm. *Seed Science Research*
<https://doi.org/10.1017/S0960258520000239>
10. Pritchard HW (2020). Commentary - Diversity in longevity of biodiverse seeds. *Seed Science Research*
<https://doi.org/10.1017/S0960258520000306>
11. Jayanthi Nadarajan, Karin van der Walt, Carlos A. Lehnebach, Hassan Saeiahagh & Ranjith Pathirana (2020). Integrated ex situ conservation strategies for endangered New Zealand Myrtaceae species, *New Zealand Journal of Botany*, DOI: 10.1080/0028825X.2020.1754245
12. Karin Van der Walt , Peter Kemp , Svetla Sofkova-Bobcheva , David J. Burritt & Jayanthi Nadarajan (2020): Seed development, germination, and storage behaviour of *Syzygium maire* (Myrtaceae), a threatened endemic New Zealand tree, *New Zealand Journal of Botany*, DOI: 10.1080/0028825X.2020.1794911
13. Nadarajan J, Esfandiari A, Kaji R, Norling C, Morgan E. November (2020). Assessment of seed germination and seedling vigour following priming and storage on two *Actinidia chinensis* varieties. A Plant & Food Research report prepared for: Milestone No. NA. Contract No. NA. Job code: P/880006/05.
14. J. M. Asomaning (2020). Storage of *Terminalia superba* Engl. & Diels. Seeds. *Journal of Experimental Agriculture International* 42(8): 85-94. DOI: 10.9734/JEAI/2020/v42i830574.

Late 2019 publications

15. Hamit Ekinçi, Jayanthi Nadarajan and Yelda Özden Çiftçi (2019). Medium- and Long-Term Conservation of Ornamental Plants Using Synthetic Seed Technology. M. Faisal, A. A. Alatar (eds.), *Synthetic Seeds*, https://doi.org/10.1007/978-3-030-24631-0_11
16. Sara Mira, Jayanthi Nadarajan, Udayangani Liu, Maria Elena González-Benito and Hugh W. Pritchard (2019) Lipid Thermal

	<p>Fingerprints of Long-term Stored Seeds of Brassicaceae. Plants 2019, 8, 414; doi:10.3390/plants8100414</p> <p>17. Nagel M, Alqudah A M, Bailly M, Rajjou L, Pistrick S, Matzig G, Börner A, Kranner I: Novel loci and a role for nitric oxide for seed dormancy and pre-harvest sprouting in barley. <i>Plant Cell Environ.</i> 42 (2019) 1318-1327. dx.doi.org/10.1111/pce.13483</p> <p>18. Nagel M, Seal C E, Colville L, Rodenstein A, Un S, Richter J, Pritchard H W, Börner A, Kranner I: Wheat seed ageing viewed through the cellular redox environment and changes in pH. <i>Free Radic. Res.</i> 53 (2019) 641-654. dx.doi.org/10.1080/10715762.2019.1620226</p> <p>19. Rehman Arif M A, Börner A: Mapping of QTL associated with seed longevity in durum wheat (<i>Triticum durum</i> Desf.). <i>J. Appl. Genet.</i> 60 (2019) 33-36. dx.doi.org/10.1007/s13353-018-0477-y</p> <p>20. Emery, N.J. and Offord, C.A. (2019). The effect of the endocarp, heat-shock and short-term storage on the germination of <i>Persoonia hirsuta</i> (Proteaceae) seeds. <i>Seed Science and Technology</i> 47: 107-112</p> <p>21. Sommerville, K. D., Cuneo, P., Errington, G., Makinson, R.O., Pederson, S., Phillips, G., Rollason, A., Viler, V. and Offord, C.A. (2019). Cobseration in the wake of myrtle rust – a case study on two critically endangered Australian rainforest plants. <i>Pacific Conservation Biology</i> https://doi.org/10.1071/PC1902</p> <p>22. Streczynski R., Clark H., Whelehan L. M., Ang S-T., Hardstaff L. K., Funnekotter B., Bunn E., Offord C. A., Sommerville K. D., Mancera R. L. (2019). Current issues in cryopreservation and importance for conserving threatened Australian native species. <i>Australian Journal of Botany</i> 67: 1-15. https://doi.org/10.1071/BT18147</p> <p>23. Hardstaff L. K., Sommerville K. D., Funnekotter B., Bunn E, Offord C. A. and Mancera R. L. (2020). Cryostorage of Australian rainforest species. <i>Australasian Plant Conservation</i> 28 (3): 9-11.</p>		
	C. SEMINARS		
		proposed	collaboration
		finalisation	
1	<p>13th Triennial International Conference of the International Society for Seed Science: Seed Innovation Systems for the 21st Century, 9-13 August 2021, University of Sussex Brighton, UK. Organisation: Dr Louis Colville & Professor Hugh Pritchard (Kew) supported by a Local Organising Committee and International Programme Committee</p> <p>Target: ISTA session, one invited lecture and at least two oral presentations from the committee</p>	2021	Provisionally on target (depending upon if the conference is being held)

2	<p>Australasian Seed Science Conference, 5-9 September 2021, Australian National Botanic Gardens, Canberra, ACT, Australia</p> <p>Target: one invited lecture and at least two oral presentation from the committee</p> <p>The Australasian Seed Science Conference is postponed from April 2020 to an on-line conference in September 2021. The intent of this conference is to provide a forum to strengthen professional networks and facilitate an exchange of scientific knowledge relating to advances in seed biology and ecology; seed bank management; and the sourcing, use and importance of seed in traditional and cultural practices. It will include presentations and workshops on seed banking, with a focus on maximising seed storage potential. Members of the ISTA STO committee are contributing the organising, and scientific program committees as well as workshop development and delivery.</p>	2021	On target (on-line delivery)
3	<p>ICAR-IISS, Mau, India organising a webinar' on seed quality assurance and scientific storage aspects. 10th September 2020 (online event)</p> <p>Target: Jayanthi Nadarajan will give an invited talk</p> <ul style="list-style-type: none"> The invited webinar talk was presented. http://seedres.in/media/Webinar%20news%20for%20website.pdf 	2020	Target achieved
4	<p>ISTA Annual meeting. 31 May-03 June 2021, Cairo, Egypt</p> <p>Target: at least two oral presentation from the committee</p>	2021	Provisionally on target (depending upon if the conference is being held)
D. WORKSHOPS			
		proposed	collaboration
		finalisation	
		2021	MOI
<p>A seed storage workshop in collaboration with Seed Moisture Committee during the ISTA Annual meeting. 31 May-03 June 2021, Cairo, Egypt</p>		Provisionally on target (depending upon if the conference is being held)	
E. SPECIAL PROJECTS			

project title / subject		proposed	collaboration
collaborating committees		finalisation	
1	<p>Vertically transmitted endophytes in Myrtaceae species – implications for seedling establishment and seed banking (Led by Jayanthi Nadarajan)</p> <ul style="list-style-type: none"> This proposal will not be submitted due to the delay in having the consultation with the relevant Iwi (Maori) group for seed collection. This consultation is a legal requirement in New Zealand. 	<p>2022</p> <p>Target not achieved</p>	
2	<p>Post-storage reinvigoration/seed priming and storage for 24 months on Hybrid Sweet Corn, Onion and Hybrid Cabbage seed lots (Led by G.V. Jagadish & Sershen)</p> <ul style="list-style-type: none"> This proposal is being developed by Jagadish and Sershen and will be submitted for funding in January 2021. 	<p>2022</p> <p>On target</p>	
3	<p>The role of oxygen in seed storage (Led by Steven Groot).</p> <ul style="list-style-type: none"> This proposal will not be submitted due to logistic issues and higher personal cost which could not be recovered from this project funding. 	<p>2022</p> <p>Target not achieved</p>	
4	<p>Use of equilibrium relative humidity measurements for determining the moisture status of stored seeds</p> <ul style="list-style-type: none"> This is an additional proposal in collaboration with MOI TCOM which will submitted for funding in January 2021. 	<p>2022</p> <p>On target</p>	MOI COM

13. TEZ Tetrazolium Committee

TEZ Tetrazolium Committee			
COMMITTEE MEMBERSHIP LIST			
1	CHAIR: Steffi Krämer		Germany
2	VICE-CHAIR: Sergio Pasquini		Italy
3	Ignacio Aranciaga		Argentina
4	Maria Aranguren		Argentina
5	Alessandra Arioli		Italy
6	Sunita BH		India
7	Valerie Blouin		France
8	Gary Duffy		Ireland
9	Jose Franca-Neto		Brazil
10	Soo-Yuong Kim		Korea
11	Linda Maile		United Kingdom
12	Augusto Martinelli		Argentina
13	Tauhid Parvez		Canada
14	Eunhee Soh		Korea
A. RULES DEVELOPMENT			
<u>A2. Introduction of New Species</u>			
	Species and test	proposed	collaboration
		finalisation	
1	Tetrazolium test on Larix	unknown	FTS
2	Tetrazolium test on Picea	unknown	FTS
3	Tetrazolium test on Glycine max	unknown	
4	Tetrazolium test on Pennisetum	unknown	
<u>A3. Introduction of Rules Changes</u>			
	Subject	proposed	collaboration
		finalisation	
B. PUBLICATIONS			

	<u>B2. Training publications on specific seed testing topics</u>		
	Publication title	proposed	collaboration
		finalisation	
1	Reorganise Handbook Tetrazolium	unknown	
2	Revision of the TEZ working sheets	ongoing	
3	Continue TEZ Working sheets	ongoing	
	C.Workshop		
	Workshop in Izmir Turkey	March 2020 cancelled	GER
	Quality Assurance, MOI, TEZ, Workshop in Verona	June 2020 cancelled	FTS, MOI
	D. PROFICIENCY TESTS		
	Proficiency test subject	proposed	collaboration
	location	finalisation	
1	Allium poroum (PT 20-3)	2020	PTC
2	Medicago melilotus (PT 21-2)	2021	PTC
3	Lolium perenne (PT 22-1)	2022	PTC
	F. SPECIAL PROJECTS		
	project title / subject		
	collaborating committees	proposed	collaboration
		finalisation	
1	none		
	E. QUESTIONS TO THE COMMITTEE		
	TZ on coated Fescue	February 2020	USA
	TZ on Coriander	February 2020	France
	TZ on Zea and Sorghum	May 2020	Italy
	TZ on fresh ungerminated seeds	June 2020	Philippines
	TZ on Watermelon	July 2020	Chile
	TZ on Abelmoschus	August 2020	South Africa
	TZ on Barley	September 2020	France
	TZ on Rumex	October 2020	New Zealand
	TZ on Allium	November 2020	Germany

14. VAR Variety Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	Chair: Ana Laura Vicario	Argentina	Member since 2007
2	Vice-Chair: Daniel Perry	Canada	Member since 2013
3	Anne Bernole	France	Member since 2016
4	Berta Killermann	Germany	Member since 2004
5	Chiara Delogu	Italy	Member since 2007
6	Elisa Vieira	Brazil	Member since 2007
7	Hedwich Teunissen	Netherlands	Member since 2007
8	Kae-Kang Hwu	Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu	Member since 2007
9	Ksenija Markovic	Serbia	Member since 2013
10	Ksenija Taski-Ajdukovic	Serbia	Member since 2010
11	Keshavulu Kunusoth	India	Member since 2010
12	Verena Peterseil	Austria	Member since 2016
13	Marie José Côté	Canada	Member since 2016
14	Marie-Claude Gagnon	Canada	Member since 2020
15			
A. RULES DEVELOPMENT			
A1. Introduction of New Methods			
			remarks
	Method name	proposed	collaboration
	subject	finalisation	update
			progress
1	DNA based methods for oats and peas.	2021	SEC, STA, Leader: MJ Côté from Canada. CT2 has finalized. Summary of results will be ready by end of January and complete data analysis is expected by June with the help of STACOM.
2	DNA based methods for barley	2021	SEC, STA, Leader: Verena Peterseil from Austria. CT2 has been initiated. Reporting results are pending due to COVID situation. Results are expected by middle of next year.

3	ISTA/AOSA preliminary investigation project for annual ryegrass in perennial ryegrass	2021	SEC, STA, AOSA, ISF	<p>Leaders: Giovanni Lopez from the Netherlands (ISTA) and as co-lead Dan Curry from the USA (AOSA).</p> <p>As a final verification of the method, real-time PCR analysis of pure (non-blended) seed of five varieties (same seed lots as used previously) was repeated in a second lab. The results followed the same patterns observed previously, confirming that the association between the annual marker and the annual growth habit is incomplete and that estimates vary depending upon which varieties are used in the calibrator.</p> <p>So the group decided to develop and investigate new DNA markers in ryegrass and for that a new member from USDA was welcomed, Shaun Bushman. Sequencing of ryegrass genomes is underway. A request for special project funding will be presented by January 20th 2021 for validation of new markers.</p>
A2. Introduction of New Species				
				remarks
	Species and test	proposed	collaboration	update
		finalisation		progress
	None			
A3. Introduction of Rules Changes				
				remarks
	Subject	proposed	collaboration	update
		finalisation		progress
	None			
B. PUBLICATIONS				
B1. Publications to accompany the Rules				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
2	Handbook - DNA based methods	2022	SEC, STA, GMO, Editorial	No progress since last report.
B3. Scientific information publications				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	VARCOM progress report 2020 was published on STI	2020	SEC	finalized

C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	India - Species and Variety testing - DNA based methods, electrophoresis, statistics, conventional methods	2022	SEC	Leader: Kunusoth Keshavulu, India. Organization started. Planned for June, 2019 but postponed due to insufficient registration. Now rescheduled to September / October, 2022.
<u>C2. Seminars</u>				
				remarks
	Seminar subject	proposed	collaboration	update
	location	finalisation		progress
1	Participation at the UPOV BMT meeting	23-25 September 2020, online meeting	SEC	Ana Vicario presented ISTA and VARGCOM activities during the meeting
2	Participation at the APSA meeting	November 25 th , 2020, online meeting	SEC	Chiara Delogu presented ISTA and VARGCOM during the meeting.
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
1	DNA based methods (SSR) - wheat	2019	STA, SEC, Accreditation Department	PT rating system was prepared by Daniel Perry based on the draft prepared by Jean-Louis Laffont and was agreed together with crop leaders and auditor leader at ISTA. Planning of the PT is in progress with the first round expected to be run in 2021.
E. SPECIAL PROJECTS				
	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
F. QUESTIONS TO THE COMMITTEE				

	subject of question			from
				country
	None			
G: Further Comments - Responsibilities				
<u>leader of working groups</u>				
1	PT leader for wheat			Daniel Perry (CA)
2	CT leader for soybean, pea and oat			Marie José Côté (CA)
3	CT leader for barley			Verena Peterseil (AT)
4	Lolium WG leader			Giovanni López (NL)
<u>contact persons</u>				
	ECOM			Berta Killermann (DE) Keshavulu Kunusoth(IN)
	UPOV			Ana Laura VICARIO (AR)
	Website			None (at present)
	Workshops			To be determined
	Permanent guest from UPOV			Leontino TAVEIRA (leontino.taveira@upov.int)
	Permanent guest from OECD			Gerry HALL (gerry.hall@sasa.gsi.gov.uk)

15. VIG Seed Vigour Committee

COMMITTEE MEMBERSHIP LIST				
			change comments	
1	CHAIR: Alison Powell	United Kingdom		
2	VICE-CHAIR: Hulya Ilbi	Turkey		
3	I-Chen Cheng	Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu		
4	Ibrahim Demir	Turkey		
5	Carina Gallo	Argentina		
6	Simon Goertz	Germany		
7	G.V. Jagadish	India		
8	Mohammad Khajeh Hosseini	Iran		
9	Tim Loeffler	United States		
10	Stan Matthews	United Kingdom		
11	Carey Matthiessen	Canada		
12	Gillian McLaren	United Kingdom		
13	Takashi Shinohara	Japan		
14	Marie-Hélène Wagner	France		
15	Yan Rong Wang	China		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods				
			remarks	
	Method name	pro pos ed	collaboration	update
	subject	fina lisa tion		progress
1				
A2. Introduction of New Species				
			remarks	
	Species and test	pro pos ed	collaboration	update
		fina lisa tion		progress
1	Radicle emergence test: <i>Elymus nutans</i>	202 1		Comparative test completed, results being analysed
2	Radicle emergence test: <i>Avena sativa</i> .	202 1		Comparative test completed, results being analysed.
3	Radicle emergence test: <i>Allium cepa</i>	202 1		Seed for comparative test failed to be delivered to WG leader. Two new seed sources have been identified and

				comparative test will proceed after identification of lots with vigour differences.
4	Radicle emergence test: <i>Glycine max</i>	202 1		In progress. Further field trial to be completed to test relationship between field emergence and radicle emergence.
5	Radicle emergence test: <i>Solanum lycopersicum</i>	202 1		Analysis of emergence and radicle emergence data completed. Feasibility of comparative test to be considered
6	Radicle emergence and conductivity tests as potential vigour tests for five vegetable Brassica species. (ISTA special project)	202 1	Germination committee	Radicle emergence and conductivity tests have been shown to relate to field and glasshouse emergence. Use of multispectral imaging to assess radicle emergence has been examined. Planning of comparative test for radicle emergence in progress. First paper for a research publication has been drafted
7	Radicle emergence and conductivity test for cabbage (<i>Brassica oleracea var capitata</i>) and cauliflower (<i>B. oleracea var botrytis</i>)	202 1	Sakata (India)	Two laboratories have applied both tests to cabbage (6 lots) and cauliflower (9 lots). This data will provide additional information to the ISTA special project (point 6)
8	Radicle emergence test for spinach (<i>Spinacia oleracea</i>)	202 2		Conditions for assessment of radicle emergence being determined
9	Radicle emergence test for sweet corn (<i>Zea mays</i> convar. <i>saccharata</i>)	202 2		Conditions for assessment of radicle emergence being determined
10	Radicle emergence test for dill (<i>Anethum graveolens</i>)	202 2		Conditions for assessment of radicle emergence being determined
11	Field emergence in barley: comparisons to relate to radicle emergence test	202 2		Developing approach to automated detection of the radicle
A3. Introduction of Rules Changes				
				remarks
	Subject	pro pos ed	collaboration	update
		fin a li sa tion		progress
1				
B. PUBLICATIONS 2020				
B3. Scientific information publications				
				remarks
	Publication title	pro pos ed	collaboration	update
		fin a li sa tion		progress
1	Seed vigour evaluation in petunia seed lots to predict seedling emergence and longevity.	202 0	I. Demir, N. Ertürk, and Z. Gokdas.	<i>Seed Science and Technology</i> , 48 , 391-400

2	Seed vigour evaluation of rocket (<i>Eruca sativa</i> Mill.) seed lots	2020	E.Ozden, N. Memis, Z. Gokdas, E. Catikkas and I. Demir	<i>Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi</i> , 10 , 1486-1493.
3	Single count of radicle emergence, DNA replication during seed germination and its relation to vigour in alfalfa seed lots	2020	M. Cheshmi and M. Khajeh-Hosseini	<i>Seed Science and Technology</i> , 48 ,367-380.
5	Single radicle emergence count for predicting vigour of marigold (<i>Tagetes</i> spp.) seed lots	2020	H. Ilbi, A. A. Powell and O. Alan (2020)	<i>Seed Science and Technology</i> , 48 , 381-389
6	Revision of Vigour Test Handbook	2022	Vigour Committee	Drafts of 6 chapters completed; the remainder in progress
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	Seed quality management seminar, Bangkok, Thailand	17-18 February	APSA	Presented by Tim Loeffler, Stan Matthews, Alison Powell and Marie-Helene Wagner
2	Seed Vigour workshop, Bangkok, Thailand	19-21 February	APSA	Presented by Tim Loeffler, Stan Matthews, Alison Powell and Marie-Helene Wagner
3	Online seminars on Seed Vigour (Argentina)	2, 9, 16 and 23 October		Presented by Carina Gallo
4	Paper on radicle emergence test at 1st Argentinian Seed Congress (presented online)	3-4 November		Presented by Carina Gallo
5	Workshop on germination, viability and vigour	Postponed from May 2020	Germination and Tetrazolium committees	
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update

	location	finalisation		progress
	Conductivity test <i>Phaseolus vulgaris</i>	2020	PT	Completed
F. SPECIAL PROJECTS				
	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
1	Protein and DNA damage and their repairs controlling vigour and longevity of Desi chickpea seeds		M. Khajeh Hosseini	Practical work completed
2	Radicle emergence and seed longevity in cucurbits (<i>Cucurbita pepo</i>)		I Demir	In progress
3	Relationship between radicle emergence counts and final germination: pepper, onion, carrot		I Demir	In progress
3	Influence of environmental conditions and farm management on the quality of wheat seeds produced in the North east of Iran		M. Khajeh Hosseini	Seed samples collected from 100 farms, purity, 1000 seed weight, seed moisture content, germination assessed. The vigour test is going on 100 seed lots.
E. QUESTIONS TO THE COMMITTEE				
	subject of question			from
				country
1	Quality standards /thresholds for vigour tests. How to set standards and validate them	January		Japan
2	Interpretation of EC results for soybean	January		South Africa
3	Moisture content for CD test on carrot Conditions for SSAA test for carrot and onion Addition of water during the RE test	February		Japan
4	Re-testing and reporting results for EC	March		Sweden
5	Seed Vigour Index: number of seedlings and replicates, unit for fry weight	April		India
6	Vigour test for Cucurbita	May		South Africa
7	RE test for maize: is 13°C suitable for tropical material?	May		Brazil

8	Vigour test for snake gourd	June		Japan
9	Plans for establishing routine vigour tests	June		Finland
10	Why are petit pois varieties of peas not included in the EC test?	August		Netherlands
11	Can germination tolerance tables be used for the cold test?	August		Netherlands
12	EC for treated seeds	August		Netherlands
13	Equipment for vigour testing	October		China
14	Complex stress vigour test: problems of mouldy seeds	October		China
15	RE test for <i>Helianthus annuus</i>	October		South Africa
16	What to do if EC values are greater than the maximum in tolerance tables	October		India
17	Questions on the results of RE test for <i>Helianthus annuus</i> conducted at different temperature	November		South Africa
18	Is the cell constant of 1 important for the EC test	November		Finland
19	Calibration of the dip cell for EC: is temperature important?	December		Thailand
20	Vigour tests for vegetable species	December		Unknown

	New project
	New proposed finalisation date