



ISTA
Seed Quality Assurance

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Activity report of the International Seed Testing Association (ISTA) Committees 2023

This yearly Activity Report was prepared by the Technical Committees (TCOMs), the Executive Committee (ECOM), 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 2023, the budget for 2023 and preliminary budget for 2024.

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 2024.

The Activity Report was endorsed by the Executive Committee for submission to the ISTA Ordinary General Meeting 2024, to be held on July 04, 2024, 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) 2023

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 2023 to 31 December 2023. Details from the February 2024 ECOM meeting are not included but will be reported on at the 2024 annual ISTA meeting.

The Executive Committee 2022-2023 was composed of:

Officers:

Keshavulu Kunusoth (President)	India
Ernest Allen (Vice-President)	United States of America

Members-at-large:

Steve Jones (Immediate Past President)	Canada
Ignacio Aranciaga	Argentina
Craig McGill	New Zealand
Sylvie Ducournau	France
Ruel Gesmundo	Philippines
Berta Killermann	Germany
Claid Mujaju	Zimbabwe
Sergio Pasquini	Italy
Vanessa Sosa	Uruguay

Ex-Officio member: Attilio Lovato (ISTA Honorary President), Italy (deceased 14 January 2024)

This is the report for the Executive Committee, covering the period from 1 January to 31 December 2023.

The work of the Executive Committee was guided until 11 May 2022 by the 2019-2022 ISTA Strategy reviewed and voted on by the membership at the 32nd ISTA Congress Hyderabad, India. It is now guided by the 2022-2025 Strategy reviewed and voted on by the membership at the 33rd ISTA Congress in Cairo, Egypt. Implementation of the strategy is a key goal of the Association and within the Executive Committee implementation is achieved through ECOM Working Groups (WG). 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, and for some topics the ISTA Membership though it Designated Voting Members.

The working groups for the 2022-2025 Triennium are (working group Chair in brackets): Accreditation (Sylvie Ducournau), the Articles of the Association (Ernest Allen), Finance (Ernest Allen), International

Relations and Designated Authorities (Steve Jones), Events (Berta Killermann), Marketing and Publications (Ignacio Aranciaga), Science and Technology Working Group (Ernest Allen), Seed Health (Craig McGill), Technical Committees (Craig McGill), Vegetable Seeds Industry (Berta Killermann). Executive Committee working groups have been meeting online when required and as needed during the ISTA Executive Committee Meetings in February and May-June. See sections A.3.1 to A.3.11 for reports from the Working Groups.

2. Meetings of the Executive Committee

The February 2023 Executive Committee meeting was held in Washington DC from 13-17 February at the United States Department of Agriculture (USDA) Offices. The meeting was facilitated by Ernest Allen and hosted by the USDA. Prior to the Executive Committee meeting members of the Executive Committee working on expanding the use of new technologies in seed testing including into the ISTA Rules visited the Bayer Seed Testing Laboratory (9 February) in Waterman, Illinois and the Corteva Seed Testing Laboratory (10 February) in Tipton, Indiana. The purpose of these visits was to observe the use of new technologies, including automation, in ISTA-accredited laboratories to identify how these match ISTA-accreditation requirements and, more generally, how the laboratory manages the many processes and programmes needed to maintain both the high quality needed and meet the large testing demands.

The Chairs of the Executive Committee Working Groups meet on 12 February for final preparation of the Executive Committee Meeting beginning the next day. Key items discussed were (i) the 2023 budget and proposed budget for 2024 focussing on responding to increased costs coming from inflation pressures in Zurich, and (ii) a proposal from the Accreditation Working Group to require non-substantial non-conformities identified in an audit to be addressed within a reduced timeframe.

During the Executive Committee Meeting, the Executive Committee discussed final preparations for the 2023 Annual Meeting in Verona Italy, including finalising the 2022 Activity Report of the ISTA Committees, the Ordinary General Meeting programme, the Rules proposals for the 2024 ISTA Rules, the 2023 budget, draft budget for 2024, and proposals for the 2024 membership fees. In addition, the Executive Committee discussed and agreed proposing raising the fee of the ISTA paper certificate from 3.25 to 4.00 CHF effective from 1 January 2024.

On Wednesday 15 February a meeting was held with North American seed organisations: America Seed Trade Association, Canadian Food Inspection Agency, Canadian Seed Growers Association, Seeds Canada, Association of Official Seed Analysts, Society of Commercial Seed Technologists, USDA - Agricultural Marketing Service, USDA - Forest Service, Association of Official Seed Certifying Agencies, and Association of American Seed Control Officials to discuss areas of mutual interest. These areas were Rules harmonisation between ISTA and AOSA, where ISTA and AOSA / SCST could work together through their respective technical committees for method development including, tropical and sub-tropical species and seed health methods. Outcomes were:

- (i) Agreement that development of seed health methods where no method is currently available is a critical need.
- (ii) Opportunities for collaboration between ISTA and AOSA / SCST on new technologies will be explored.
- (iii) Harmonisation of ISTA and AOSA Rules will be ongoing for both current rules and for the introduction of new rules.

The second series of Executive Committee Meetings were held before and after the 2023 ISTA Annual Meeting in Verona (27-28 May and 2 June) and a meeting with the Chairs of the ISTA Technical Committees (28 May). The ISTA Executive Committee meetings discussed the expansion of tropical and sub-tropical species in the ISTA Rules to facilitate movement of these species in trade in support of increased food security globally. The success of the Young@ISTA programme was reviewed with the outcome that the Executive Committee agreed that the programme will continue and means to expand will be investigated. The Executive Committee also finalised the policy for inclusion of new technologies equivalent to the human

analysts into the ISTA rules. A joint webinar series between ISTA and FAO on new technologies for seed quality assurance was developed during the meeting. Progress on achieving the ISTA Strategy was also reviewed.

The Executive-Technical Committee Chair meeting discussed the new technologies policy, inclusion of new species in the Rules, the review of the CHF 100 000 special projects and harmonisation of ISTA and Association of Official Seed Analysts (AOSA) testing methods.

A meeting between the Executive Committee and the ISTA Designated Voting Members was held during the Annual Meeting (on 30 May). Items discussed were celebrating 100 years of ISTA with proposals to have a joint ISF-ISTA forum, centenary dinner and forum with the designated authorities presented, updates on the e-Certificate project, further explanation, and discussion on the proposal to increase the cost of the ISTA Certificates from CHF3.25 to CHF 4.00, an update on the Seed Health initiative was given and Young@ISTA.

3. Activities of the Executive Committee Working Groups

The Executive Committee working groups have worked on the following:

3.1 Accreditation Working Group

Members: Sylvie Ducournau (Chair), Berta Killermann, Vanessa Sosa, Steve Jones, Sergio Pasquini, Florina Palada.

As consolidated over 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

At the ISTA Secretariat the Accreditation Department is composed of four staff. The audits were performed by 22 ISTA contracted auditors and three ISTA Secretariat auditors and the audits administration, coordinated by the Head of Accreditation and Technical Department.

One technical auditor, one system auditor, one technical expert for GMO and Variety testing and one GMO expert were approved in 2023. Two technical auditors decided to discontinue performing ISTA audits. Four more candidates to be contracted ISTA auditors are in different steps of the approval process (two technical auditors, one system auditor, one Seed Health expert).

Overview - ISTA audits

In 2023 the audits, 46 in total, were performed with on-site assessment apart from one audit performed partially remote and one audit performed completely remotely due to the difficulties of the assigned auditors to travel internationally.

For both audits performed remotely or partially remotely, the approval of the Accreditation Working Group was required.

This year were audited first time two laboratories with sampling units in the scope. The process is now adjusted according to the practice and the related quality documentation implemented.

Case studies on ISTA accreditation status

The AWG collaborated in the evaluation of specific cases e.g., suspension of a laboratory due to poor PT results, extension of the scope, starting of the accreditation process.

Reviewing or strengthening the quality documentation

Reviewing and updating documents is a continuous ongoing process. In 2023 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 proposed for approval to the full ECOM. The final format was ready for ECOM approval during the Annual Meeting organised in Verona.

Cooperation with the ISTA Technical Committees

The AWG and ATD often contact the ISTA Technical Committees to clarify specific issues arising during audits or for clarifications relating to the ISTA Rules. A specific collaboration exists with the Proficiency Test (PT) Committee for the development and improvement of the PT programme.

On the other hand, ATD and AWG have been contacted by TCOMs for matters related to the accreditation standard, or revision of some chapters of the ISTA Rules.

Challenges

One of the most important challenges of 2023 was the change of the policy regarding the due dates to address the non-conformities identified during the ISTA audits. The implementation of the ECOM decision taken in February 2023 was implemented for all laboratories audited in 2023.

The new revised ISTA Accreditation Standard brings new aspects to be considered by the ISTA auditors and the audited laboratories such as machineries replacing the human analysts and risk assessment aspects.

The design of the Accreditation Certificate and Certificate of appointment for the contracted auditors was changed considering the ISTA corporate identity.

Accreditation documents to be used in 2024 were revised for the changes in the ISTA Accreditation Standard and prepared with the new ISTA Logo for celebration of 100 years of ISTA.

The ISTA crop groups were revised to add *Penisetum glaucum* under Cereals crop group as well (change valid from June 2023) and *Ricinus* in Other agricultural crop group (change valid from January 2024)

Special projects

The interactive learning tool on how to complete ISTA Certificates is maintained and updated after each revision of the ISTA Rules.

One Quality Assurance Workshops for beginners was organised in October in Hyderabad India.

In the same month, the HoAT has been one of the lecturers providing in Bangladesh a Basic Course In Seed Production, Certification, Sampling and Testing for Seed Quality Assurances.

The preparation of a Quality Assurance Workshop for advanced level participants is planned for January 2024 in South Africa and is almost finalised.

One webinar on how to address non-conformities identified during an ISTA audit was provided in October 2023 and two more webinars related to staff monitoring are in preparation for 2024.

The Auditors workshop organised this year in December in Poznan gave the opportunity to the ISTA auditors to discuss several aspects such as changes of the ISTA Rules, revision of the ISTA Accreditation Standard and policy regarding non-conformities identified during an ISTA audits. Several actions to be taken were decided at the end the workshop and some started to be implemented.

The PT coordinator in collaboration with the GMO Committee and after discussion with the ISTA Accreditation Department, developed a List of Standardised Terms in GMO Testing. In addition, it was decided to adopt a new format of the Scope of Accreditation for these tests to be published on the ISTA website. The objectives were to make more uniform and transparent the "Scope of accreditation" of laboratories published on the ISTA website, allowing a better understanding by customers, to be of guidance to auditors in evaluating applications and assessing data supporting accreditation (e.g.

validation/verification, PDE, etc.) and also to facilitate uniformity in the issuing of ISTA certificates with GMO testing results.

3.2 Articles of the Association Working Group

Members: Ernest Allen (Chair), Craig McGill, Ignacio Aranciaga, Keshavulu Kunsoth, Andreas Wais. There were no Article change proposals to vote on at the OGM in 2023.

There were no proposals for Article changes for the working group to progress during 2023 for voting on during the OGM 2024.

3.3 International Relations and Designated Authorities Working Group

Members: Steve Jones (Chair), Craig McGill, Ruel Gesmundo, Olga Stöckli, Keshavulu Kunsoth, Andreas Wais.

The focus of the working group is on strengthening interaction between ISTA and its Designated Authorities (DAs) as well as fostering relationships with other international organisations. The DA & IR WG plans and holds meetings with the 83 current ISTA DAs, develops the international relations policies, coordinates the representation of ISTA in international fora and meetings during Annual Meetings and Congresses, ready for discussion and approval by the whole ISTA Executive Committee (ECOM). In addition, the ECOM members and Secretary General meet with the DAs individually when visiting countries, which have or would like to have, an ISTA DA. Meetings may be physical, virtual or both.

ISTA DAs and ISTA Designated Voting Members play crucial roles to formulate the ISTA Strategy, assess the functioning of seed testing laboratories, and the use of the International Rules for Seed testing (ISTA Rules) in their respective countries and distinct economies. Any proposals for change to the ISTA strategy or ISTA Rules are voted on at the ISTA OGM by the Designated Voting Members.

Meetings with ISTA DAs

During the 2023 ISTA Congress in Verona the ECOM members and DAs met and discussed the following topics:

1. Update on plans for ISTA eCertificates.

There was considerable interest in eCertificates and how these will be utilised by the various agencies/organisations requiring access. eCertificates were beta-tested during 2022 and 2023 with the aim of making them available for use in 2023. An online session was organised for the ISTA DAs after the initial beta testing results in 2023 to enable DAs to see how the e-Certificates will operate and raise any questions/concerns.

2. The 100th year ISTA annual meeting will take place in Cambridge, UK in 2024. The ECOM asked the Designated Voting Members present for feedback on plans for the meeting. A good exchange of ideas was had.

3. Young@ISTA Project. An overview of this successful initiative was given and it was planned to continue this in the coming years. A LinkedIn forum is already established and now there are about 400 followers. It is also the hope that Young@ISTA professionals from countries/economies/regions, where ISTA is currently underrepresented, will be an integral part of ISTA's strategy to develop in those areas

4. Seed Health Strategy Development. An overview of plans to facilitate seed disease testing within ISTA was discussed. The creation and aims of an ECOM Seed Health WG were outlined.

5. The ECOM motion to increase the cost of blank ISTA paper certificates. During this discussion, a rationale to increase the blank certificates was given and questions about membership fees were answered. One DA suggested increasing the membership fees as an option to raise ISTA income, the ECOM was not in favour of this option at that time.

The ISTA ECOM also met on-line with about 45 ISTA DAs in December 2023.

The recording of the meeting is available at [ISTA Designated Authorities' Meeting 2023 \(youtube.com\)](https://www.youtube.com/watch?v=...)

The topics covered were the publication of the FAO-ISTA Handbook, an update on progress with eCertificates, plans for voting on the cost of eCertificates at the 2024 OGM, plans for the OGM 2024 and a progress report from the ECOM WG on Seed Health Strategy.

International Relations

ISTA's interactions with other international associations/organisations fall into five groups:

1. Regulatory organisations: including at the national level, the DA of member countries and international organisations such as the OECD, FAO, UPOV, IPPC. ISTA has regular contact with FAO and OECD. ISTA participates at OECD Meetings as an observer organisation on a regular basis. The joint FAO-ISTA handbook on "Guidelines for the establishment and management of seed testing laboratories" was published in 2023 and will be available in French and Spanish during 2024. Download at [Guidelines for the establishment and management of seed testing laboratories - Handbooks - International Seed Testing Association](https://www.ista-international.org/guidelines-for-the-establishment-and-management-of-seed-testing-laboratories)
2. Organisations related to ISTA accreditation: such as the International Laboratory Accreditation Cooperation (ILAC). As an ILAC stakeholder, ISTA usually participates in the annual meetings organised by ILAC. In 2023, Florina Palada attended the ILAC meeting in Belfast and found some useful updates on topics of common interest to ISTA and ILAC such as remote audits, revision of the standards to consider new technologies and monitoring staff competence. ISTA is continuing to publish information on ISTA activities in ILAC's news bulletin.
3. Scientific fora and collaboration with other associations: such as the International Seed Science Society (ISSS). A joint ISSS/ISTA webinar series was started in 2021 and a summary report provided for STI 166, October 2023, p13-14. Two joint webinars took place in 2023 the most recent webinar reaching an audience of 393 people. The webinars are popular and the feedback positive. It is planned to continue the series in 2024. For the two 2023 webinars see the recorded sessions on the ISTA YouTube channel: [Seed dormancy \(youtube.com\)](https://www.youtube.com/watch?v=...) and [Webinar - Seed priming \(youtube.com\)](https://www.youtube.com/watch?v=...)
4. Technical collaboration with other organisations to harmonise seed testing methods worldwide: such as with AOSA/SCST in the United States. ISTA usually attends the AOSA/SCST Annual Meeting in the USA and the ABRATES Congress in Brazil. The ISTA President Keshavulu Kunusoth represented ISTA at the AOSA/SCST Annual Meeting in Saskatoon, Canada in 2023. ISTA also regularly meets with ISF and in addition there is an ECOM Working Group on the technical aspects of vegetable seed sampling and testing.
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, Euroseeds and SAA. Florina Palada (ISTA Secretariat) and Claid Mujaju (ECOM member) attended a very interesting AFSTA annual congress in Dakar, Senegal along with about 280 other participants. Sergio Pasquini (ECOM member) attended the Euroseed Congress in Malta in October 2023, attended by more than 1100 participants, where discussion on a number of interesting topics for EU members took place. The ISTA President, Craig McGill (ECOM member) and Olga Stöckli (ISTA Secretariat) attended the APSA meeting in New Zealand in 2023 and continued the important collaborative work with APSA. The ISTA Secretary General, Andreas Wais attended the ISF Congress in South Africa, and the 10th session of the governing body of the International Treaty on Plant Genetic Resources for Food and Agriculture

at FAO in Rome. Andreas along with the ISTA Vice-President, Ernest Allen and Claid Mujaju (ECOM member) also attended the 1st Seed Congress of the Rwandan Seed Association held in Rwanda. The ISTA President attended the ASTA Field Crops Seed Convention, America's second-largest seed industry event at its new location in Orlando, Florida. In addition, the ISTA Vice-President attended the NAPPO meeting in Mexico. Detailed reports of many of these meetings can be found in Seed Testing International.

Another international activity is the World Seed Partnership, a collaboration between ISF, ISTA, OECD, UPOV and WFO. This activity is used as an information platform to distribute key information on seeds and the role of each organisation as partners within the seed sector. The overall aim of the World Seed Partnership is the improvement of sustainability and security of seed supply worldwide.

3.4 Events Working Group

Members: Berta Killermann (Chair), Sergio Pasquini, Keshavulu Kunusoth, Craig McGill, Olga Stöckli, Andreas Wais, Manuela Nagel (for Seed Symposium).

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 2023 the working group was involved in the organisation of

1. The ISTA Annual Meeting 2023 in Verona, Italy including the elaboration of a common programme and the seminar on "From Biodiversity to Diversification: resources, tools and technologies to meet new challenges".
2. The ISTA Annual Meeting 2024 in Cambridge, UK including the seminar "Seed quality assurance a critical component of food and nutritional security", the ISTA/ISF Forum "Quality seed production for resilient and sustainable agricultural" and the ministerial session "The Role and Future of ISTA in Seed Quality Assurance in the Face of Climate Change".
3. The 34th ISTA Congress 2025 in Christchurch, New Zealand including the scientific seed symposium.

3.5 Marketing and Publication Working Group

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

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 2023 a diverse range of digital marketing initiatives were undertaken via ISTA social media channels LinkedIn, YouTube and Twitter as well as via the ISTA website, newsletter. The LinkedIn and Twitter activities have continued with regular posts. The Newsletter is sent once a week. On X (Twitter) ISTA has more than 2500 and on LinkedIn > 11292 followers with an increased level of engagement. Finally, on YouTube, ISTA has over 1690 subscribers. Also, 4 webinars was developed (two of which ISSS-ISTA) and participated as invited in the IICA webinar.

With the aim to promote the use of the ISTA Rules worldwide and to attract more people to participate in ISTA the Marketing and Publication Working Group has worked with the Rules Committee to ensure the 2023 International Rules for Seed Testing in 4 languages (English, French, German and Spanish). Soon, the ISTA Seedling Evaluation Handbook will be available in Spanish.

The implementation of the weekly newsletter gave the possibility to increase the contact with the members and with other organization/colleagues around the world and to permit more fluid information of several topics of the Association. In 2023 ISTA reach 1,384 subscribers.

Finally, It is important to mention that all the above communications channels are growing yearly, strengthening and establishing the ISTA presence worldwide.

3.6 Science and Technology Working Group

Members:Ernest Allen (Chair), Sylvie Ducournau, Vanessa Sosa, Steve Jones, Keshavulu Kunosoth, Andreas Wais.

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.

As needed, ECOM Members of the Working Group meet to discuss needs within ISTA for documents and rules to explain the use of new technologies like machine vision, artificial intelligence etc.. ECOM Working Group Members also meet to discuss ideas with Technical Committee and Accreditation Working Groups to develop statements and guidance to be provided to the membership.

There were no topics to discuss with the TCOM sub-group members during this period.

3.7 Technical Committee Working Group

Members: Craig McGill (Chair), Ruel Gesmundo, Claid Mujaju, Nadine Ettl, Andreea Militaru, Andreas Wais, Keshavulu Kunosoth.

The Technical Committee Working Group develops Technical Committee policy for discussion and approval by the Executive Committee and works closely with the ISTA Secretariat in discussing and implementing the policy. 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. One project was approved in 2023 on Collection of Seed Images for Seed Health.

A key activity for 2023 was to review the CHF 100 000 projects to determine if the objectives of the funding had been achieved. Specifically, advancing the ISTA Strategy, increasing collaboration across Technical Committees and attracting co-funding. The review included a questionnaire to the technical committees and discussion during the Executive Committee – Technical Committee Meeting in Verona. The review outcomes will be finalised at the 2024 Annual Meeting.

The working group worked with the Secretariat to organise the Executive Committee - Technical Committee Meeting in conjunction with the Annual Meeting in Verona. In addition to the to review of the CHF 100 000 projects, topics discussed included TCOM-D-01-TCOM Responsibilities of ISTA TCOMs which the working has been reviewing, the policy for Introducing New Technologies Equivalent to the Human Analyst for Seed Analysis, preparing Rules proposals and introduction of more sub-tropical and tropical species into the Rules. The TCOM Responsibilities Document will be finalised in 2024.

3.8 Finance WG Working Group

The membership fees remained unchanged and the provision of 10% discounts for early payments, i.e. on or before 31 December 2023 were maintained.

As a reminder, in 2022, the ECOM decided to merge the Membership Fees Working Group with the Finance Working Group to facilitate discussion on all financial topics in one ECOM working group.

3.9 Young@ISTA Project

Members: Keshavulu Kunusoth (Chair), Craig McGill, Berta Killermann, Sylvie Ducournau, Andreas Wais, Steve Jones, Olga Stoeckli, Fiona Hay (for SST).

The programme was officially launched during the ISTA seed symposium-2022 held in Athens, Greece in November 2022 in the presence of a good number of younger seed professionals who were presenting their work.

In the year 2023, ISTA supported a total of 16 applicants [6 for workshops, 1 for the annual meeting, 2 application for lab-to-lab training and 6 application for SST publication assistance] coming from all continents. Some of them also recently joined ISTA Technical Committees (TCOMs) or applied to participate actively in them. As well as financial support from ISTA in 2023 the Bayer Crop Science, St Louis (USA) generously supported this programme with a donation of 5 000 USD. Sponsorship opportunities like this are open to other organisations to help support to young seed professionals under this programme.

A Young@ISTA exist in LinkedIn and is very active with 380 members, several of who were supported in 2023 and posted their thanks for the opportunity to travel to ISTA events.

3.10 ISTA – ISF Seed Health Working Group

Members: Craig McGill (Chair), Ernest Allan, Keshavulu Kunusoth, Andreas Wais, Florina Palada, Valerie Cockerell.

The role of the Seed Health Working Group is to (i) assess ISTA's current and future role in seed health and (ii) develop policy proposals, including resources needed, for discussion and voting by the ISTA Executive Committee. The Seed Health Working Group closely collaborates with the Seed Health Committee. The working group met online with the Seed Health Committee to discuss how the working group could help facilitate progress in seed health method development. On behalf of the Seed Health working group Valerie Cockerell met with the Seed Health Committee during the Annual Meeting in Verona. A capacity building Seed Health workshop will be held in 2024. A joint ISTA-ISF seminar on "Addressing the Importance of Seed Quality and Testing in Global Agriculture For Seed Health" is also in planning for 2024.

3.11 Vegetable Seed Industry Working Group

Members: Berta Killermann (Chair), Merel Langens (Vice-Chair), colleagues from the Vegetable Seed Industry, ISF and ISTA.

The Vegetable Seed Industry Working Group has members from the Seed Industry, ISF, ECOM, Technical Committees and ISTA Secretariat. The Rules proposal to increase the number of sub-lots for *Solanum lycopersicum* (tomato) at the Annual Meeting 2023 was voted on. The sub-lot experiment will continue. The possibility to reduce the weight of the working sample for the other seed determination for fruity crops is also under consideration.

3.12 Expansion of Seed Testing Worldwide Working Group

Members: Keshavulu Kunusoth, Vanessa Sosa, Ruel Gesmundo, Claid Mujaju, Sergio Pasquini, Craig McGill and Ignacio Aranciaga (Chair).

ISTA was founded in 1924 with a mission to ensure uniformity in seed quality evaluation worldwide. Since then, it has been developing, adopting, and publishing internationally agreed standard rules for seed sampling and testing and promoting uniform application of these rules to facilitate seed trade nationally and internationally, thereby supporting agriculture and food security globally.

ISTA has grown over the last 99 years to reach 83 countries and distinct economies currently, and over 400 competent and energetic seed scientists and analysts, in member laboratories and sampling entities, and individually as personal members, and associate members. Furthermore, numerous new species have been added to the ISTA Rules over time in response to requests from the seed industry, ISTA Designated Authorities and the membership. This was partly driven by the fact that the seed species traded changed over the last century in between ISTA member countries/distinct economies. ISTA is continuing its work of developing standard seed testing methods to facilitate the seed trade and make a valuable contribution to food security worldwide.

However, ISTA's presence needs to be expanded in new regions and countries where it is not yet present or is underrepresented. In addition, it is also important to further add new species to the seed testing rules, like tropical and sub-tropical species, that are moving into international trade and/or may become more important as climate becomes warmer and drier.

The ISTA Executive Committee established an ECOM Working Group to develop policies that will facilitate and provide a framework for expansion of seed testing into areas where ISTA is not yet present or underrepresented. The intention is not to limit expansion in all areas of the world but recognises that there are some areas of the world where focussed effort will be required for ISTA to expand its reach into those areas.

The aims of the working group are:

Facilitating the expansion of the involvement of ISTA into new regions and countries where it is not yet present or is underrepresented

Encouraging (membership) participation from new regions and countries where ISTA is not yet present or is underrepresented also to attract members

Facilitating the inclusion of new species, especially tropical and sub-tropical species, into the ISTA Rules

Improving presence through partnerships and collaborations with international organisations like FAO, OECD, ISF, regional seed associations, etc. and the seed industry to build seed capacity and capabilities

Facilitating the development of tests and methods, especially for "basic" tests of purity, other seed determination, moisture, germination, and viability of tropical and sub-tropical species through TCOMs to subsequently introduce to the ISTA Rules

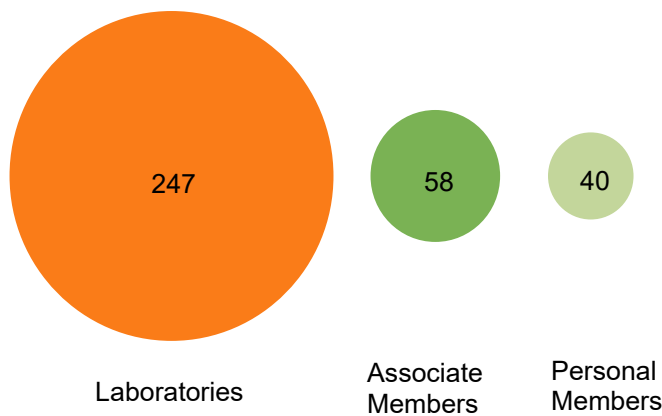
Actually we are working in different validation process in order to achieve our goals, and different kinds of activities was developed in order to increase the ISTA presence in a worldwide.

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

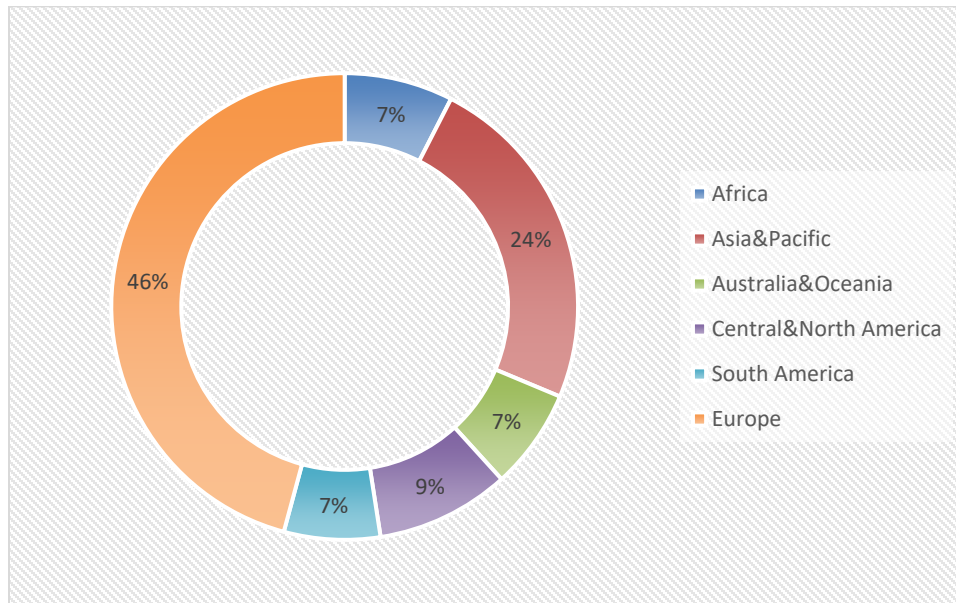
1. ISTA Membership



ISTA Membership 2023

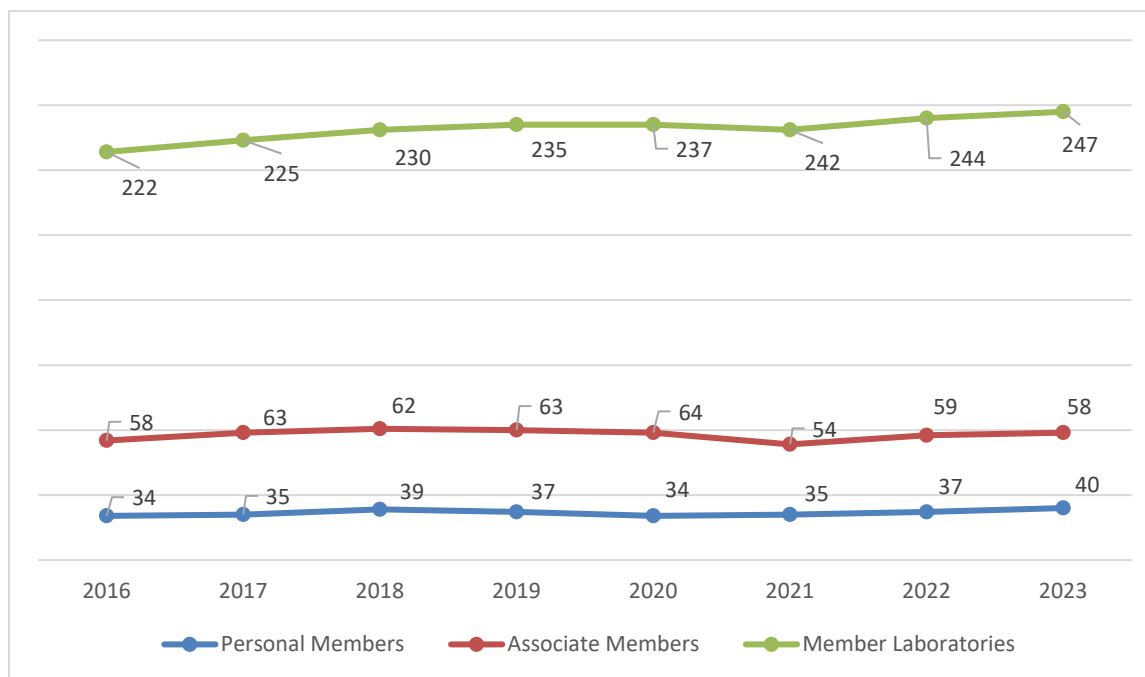


ISTA has at least one member in 81 countries





ISTA Members 2016 – 2023



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 2023 are:

Joël Léchappé (2019)

Grethe Tarp (2016)

Alison A. Powell (2013)

Ronald Don (2008)

Norbert Leist (2007)

Rita Zecchinelli (2022)

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

2. Activity Report of the Rules Committee

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 (ISTA Secretariat)

ECOM liaison officer: Ignacio Aranciaga

Members:

Ruojing Wang (PUR) Canada

Didier Demilly (PTC) France

Gillian Musgrove (GER) United Kingdom

Corinne Guimier (BSC) France

Elisa Vieira (FTS) Brazil

Ruud Barnhoorn (SHC) Netherlands

Fiona Hay (EDI) Denmark

Sergio Pasquini (TEZ) Italy

Kirk Remund (STA) United States

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

Sarah Dammen (FSC) United States

Brigitte Hamman (SSAG) South Africa

Gil Waibel (WSWG) United States

Ex-officio: Todd Erickson (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 usually originate in one of the TCOMs or are referred to the relevant TCOM 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, assisted by the Vice 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.

After the final drafts of the rule documents are completed, the Rules Chair forwards the documents to the ISTA Secretariat. The Secretariat collates the Rules proposals, validation studies, and other supporting documents into official documents that will be voted on by the membership at the Ordinary General Meeting (OGM). Following the results of the voting at the OGM, the amended Rules are edited, translated, published, and distributed to the membership as the revised International Rules for Seed Testing.

This year the ISTA Rules Session was conducted prior to the OGM via virtual meeting on 08 May 2023. Voting was conducted in person at the OGM held on 01 June 2023 in Verona, Italy.

The revised electronic version of the 2024 ISTA Rules was made available to the membership for download before 31st December 2023. This was made possible by the dedicated teamwork of the Rules Committee, the TCOMs and the ECOM, and the ISTA Secretariat. Also, special thanks goes to Vanessa Sutcliffe (HeartWood Editorial) for editing and publishing as well as Ignacio Aranciaga, Clotilde Polderman-Roussille and Elke Nitschke for translating the current rules into Spanish, French, and German.

The effective date for the 2025 ISTA Rules is 1st January 2025. 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.

Rules sales figures / downloads

Sales of online ISTA Rules for 2021-2023

Item		2021	2022		2023		
		Sold	Income (CHF)	Sold	Income (CHF)	Sold	Income (CHF)
Royalties from direct download sales (remitted in USD)	Full Rules issues	22	CHF 9'357.60	16	CHF 6'774.67	9	CHF 3'675.48
	Single chapters	70	CHF 3'427.00	30	CHF 2'820.51	14	CHF 1'251.26
Sales via Secretariat (CHF)	Multiple-user access (non-member labs)	18	CHF 25'200.00	13	CHF 18'059.68	9	CHF 12'599.86
	Single-user access (Associate Members, non members)	40	CHF 10'854.00	64	CHF 16'977.55	67	CHF 24'274.06
Total		150	CHF 48'838.60	123	CHF 44'632.41	99	CHF 41'800.66

Overview of Rules change proposals approved in June 2023

Changes to the 2024 Edition of the ISTA Rules approved at the Ordinary General Meeting in June 2023 can be found on the ISTA website at: <https://www.seedtest.org/api/rm/35T6F556FRKANC7/ogm22-05-rules-proposals-for-ista-2023-edition-1.pdf>

The supporting validation reports are also available at: <https://www.seedtest.org/api/rm/66RR664YTY5B77Z/ogm22-06-ista-method-validation-reports-2023-3-1.pdf>

Selected Summary of Changes to the ISTA Rules for 2024

Introduction to the ISTA Rules

Form 1 revised is to improve the procedures and guidance for proposing a new taxon to Table 2C.

Chapter 1

1.3, 2.2.2: Revised the maximum subplot size allowed for *Solanum lycopersicum* L. A lot of this species may now contain 20 sublots. Each subplot must contain no less than 5% of the weight of the original seed lot.

Chapter 2

2.5.2.1: Added a Calculator to the ISTA website that will assist in standardizing how working weights for Table 2C are determined.

Chapter 3

3.5.2.4: Clarification of when to use the procedures in 3.5.2.4 to classify and report indistinguishable species.

Chapter 4

4.7: Clarification to specify the number of decimal places needed for other seeds determinations.

Chapter 5

5.6.3.1, 5.6.5.3: Revised to allow testing laboratories the option of not reporting original germination results when an optional second test using dormancy breaking procedures is conducted.

Chapter 6

Table 6A Part 2: Added a tetrazolium test method for *Ulmus* spp. L.

Chapter 9

9.2.5.7: Revised oven temperatures and tolerances to reduce variation during moisture testing.

18.8: Defined special cases where it is possible to report the moisture content of seed mixtures.

Table 9A (and several sections throughout Chapter 9): Merged Parts 1 and 2 of Table 9A due to changes in crop groupings.

Chapter 11

Changes made throughout Chapter 11: Chapter 11 required several updates to remain current with new advancements.

Chapter 13

13.7: Added a requirement to report, under “Other determinations,” the number of normal seedlings in the total weight of seed tested.

Chapter 14

Changes made throughout Chapter 14: Chapter 14 required several updates to remain current with new advancements

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 2023 preparation and dispatch

In 2023 we started the new triennium program 2023-2025. As expected, the three PT leaders prepared 3100 samples, performed 12 heterogeneity tests, and added 24060 seeds in the samples for the OSD test. Also 200 mixture seed sample were prepared by the Purity Committee for training purposes without rating and included in the PT 23-2 *Raphanus sativus* (see Table B.3.1). As usual, the ISTA secretariat received the samples prepared by the PT leaders and forwarded them to the participating laboratories, securing the shipments and complying with the customs and phytosanitary requirements of the recipient countries.

Table B.3.1. List of species and test types for 2023

Round	Species	Test round scope	Test leader	Sample number	Number of participants
23-1	<i>Vicia villosa</i>	P, OSD, G	Monika Holubicova	3 x 220	184

23-2	<i>Raphanus sativus</i>	P, OSD, G, M, VIG (CT), OIC completion	Gillian Musgrove	3 x 250	209
	MIX for training	Purity Committee		200	
23-3	<i>Trifolium hybridum</i>	P, OSD, G, TSW	Susanne Andersen	3 x 230	181

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

We thank Vilmorin Sakata and DLF Trifolium companies for providing *Raphanus sativus* and *Trifolium hybridum* seeds free of charge for the preparation of the PTs.

3.2 Reporting of Proficiency test results

In 2023, the statistical analysis and reports was done by the ISTA Secretariat for three PTs PT 22-3 *Lolium perenne*, PT 23-1 *Vicia villosa* and PT 23-2 *Raphanus sativus*, representing 2321 preliminary and final reports.

The PT round 23-3 *Trifolium hybridum*, will be evaluated in March 2024.

Summary reports, heterogeneity test and seed pictures were published and are available on the ISTA website: <https://www.seedtest.org/en/proficiency-tests/standard-pt-results.html>.

The statistical analysis of the Electroconductivity test (vigour test) in PT 23-2 *Raphanus sativus* did not seem reliable and was not immediately validated.

Its analysis required a great deal of reactivity and additional investigations. The ISTA secretariat quickly investigated the analysis method used by the participating laboratories, The statistical committee, the vigour chair, the PT leader, the PTC chair and vice chair, the ECOM liaison officer and the ISTA secretariat gave convergent opinions on the methods used, the results obtained or the statistical analysis and by common agreement they cancelled this PT. The detailed reasons for this cancellation are explained in the summary report of the PT. A second set of samples are sent to the laboratories for a second testing. The Statistical Committee will use all data to develop a more suitable statistical test for electroconductivity.

We received and answered 17 questions, request of explanation or complains from participants, mainly according hardseedednes for PT 23-1 *Vicia villosa* and presence of pregerminated seeds in *Raphanus sativus* lot1.

The following diagrams represent the trend in performance of accredited laboratories versus non-accredited for the four PTs published in 2023. It is noticeable that voluntary participants have less A ratings and more C and BMP ratings in comparison with accredited laboratories.

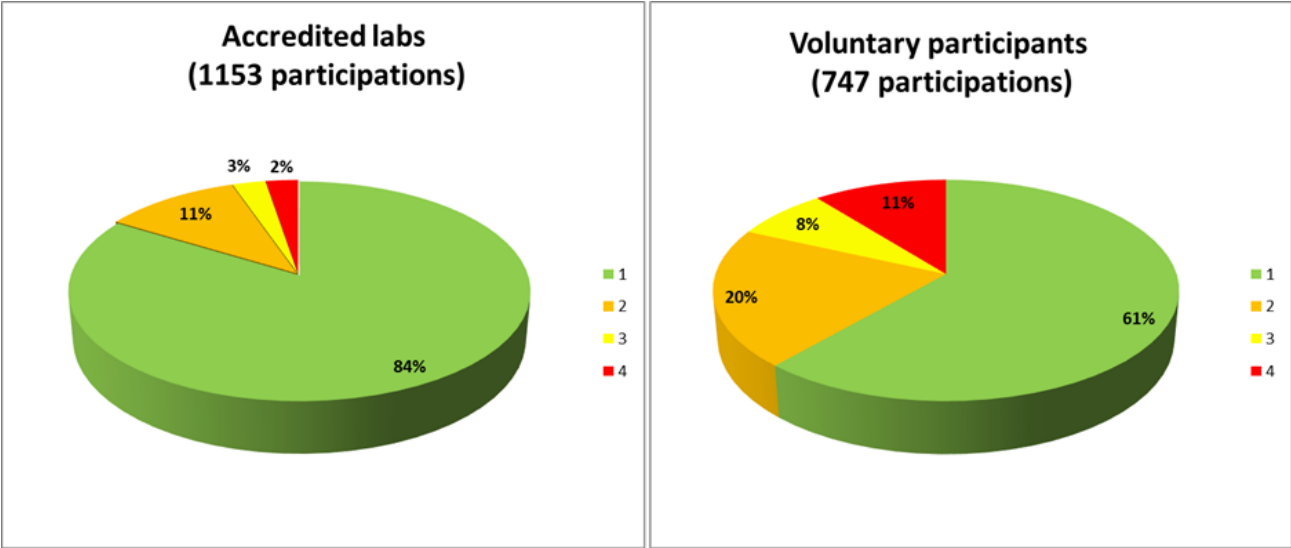


Figure 1: Laboratories rating for the year 2023 for all tests and all participants on PT22-3, PT23-1, PT23-2. Comparison between accredited and voluntary participating laboratories.

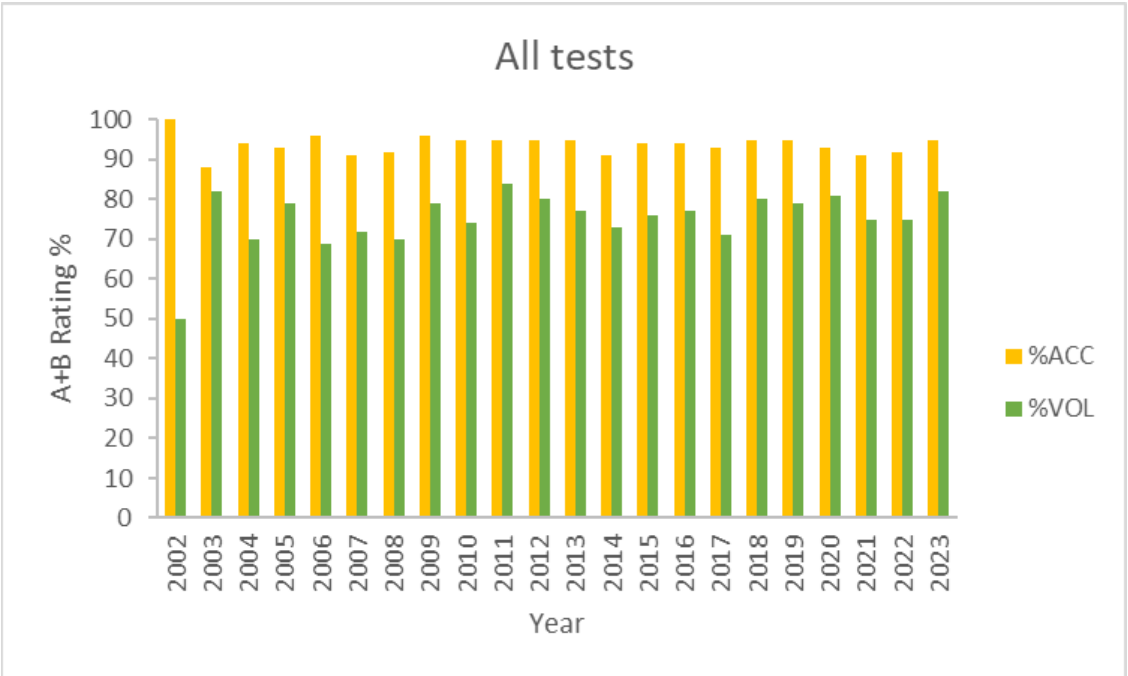


Figure 2: A and B ratings trend for accredited and non-accredited laboratories

The figure 2 shows that rating A and B is always higher for accredited compared 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. In 2023, rating was also better both for accredited and non-accredited laboratories compare to 2022.

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. These tasks require manpower and specific skills. Two PTC members have left the committee: Christian Boehm from Denmark, member from 2017 and Zita Ripka from Hungary member from 2008 and we are pleased to welcome Adrienn Abos from Hungary as a new member. The selection of seed lots for the preparation of PTs is becoming increasingly difficult because it has to meet precise multi-criteria requirements. Nevertheless, the distribution of samples remains problematic for some countries or laboratories due to customs or phytosanitary difficulties as already mentioned last year. This is despite all the efforts made by the ISTA secretariat to apply the regulations.

The three PT rounds for 2024 are already under preparation. We expect a preparation of the samples and distribution in good conditions as well as issuing final reports and archiving and keeping data secure in the database.

As in previous years, we expect all accredited laboratories to participate in the 2024 PT rounds and to achieve an A and B ratings of over 90% on all tests. And we also aim to increase the performance of non-accredited laboratories.

3.4 Audit programme

In 2023 were performed 40 re-accreditation audits, and six accreditation audits. For first time, this year, at the re-accreditation audits two laboratories included also sampling units in the scope. For 44 audits out of 46, the audit was performed with on-site assessment, one audit was performed completely remote and one partially remote.

The procedure on how to perform remote/partially remote audits approved by ECOM in 2020 was applied for both audits with the approval of the ECOM-Accreditation Working Group.

For all nine audits performed remote or partially remote, the approval of the Accreditation Working Group was required.

The Auditors workshop postponed from 2021 was organised this year in December in Poznan. The organisation was a hybrid (physical participation and on-line) and the auditors to had the opportunity to discuss several aspects such as changes of the ISTA Rules, revision of the ISTA Accreditation standard and policy regarding non-conformities identified during an ISTA audits.

As outcomes of the workshops were identified 25 actions to be taken and for some of them the implementation is already started.

3.5 Accreditation under the Performance- Based Approach

By the end of 2022, a number of 12 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
HUNGARY	HU01
ITALY	IT01 and IT03
JAPAN	JP03 and JP07
SERBIA	RS02
URUGUAY	UY02
UNITED STATES OF AMERICA	US11

The Standard PT coordinator in collaboration with the GMO Committee and after discussion with the ISTA Accreditation Department, developed a List of Standardized Terms in GMO Testing.

A new format of the Scope of Accreditation for these tests is in process to be established with the aim to be published on the ISTA website. The objective of this change is to make more uniform and transparent the “Scope of accreditation” of laboratories published on the ISTA website, allowing a better understanding by customers, to be of guidance to Auditors in evaluating applications and assessing data supporting accreditation (e.g. validation/verification, PDE, etc) and also to facilitate uniformity in the issuing of ISTA certificates with GMO testing results.

3.6 Accreditation administration

The Accreditation and Technical Departments is formed by four staff at ISTA Secretariat and supported by 22 contracted auditors.

At ISTA Secretariat the staff is formed by Florina Palada – Head of the Accreditation and technical Department, System and Technical auditor, Branislava Opra – System auditor, Standard PT coordinator and Quality Manager, Stella Marcu – System auditor and Standard PT administrator.

Until end September Neelam Ok supported the team as Audits and Standard PT administrator, and she during the maternity leave she is replaced by a new team colleague Beata Hübnerova.

Contracted auditors in 2023: 2 System & Technical auditor, 5 System auditors, 12 Technical auditors, 2 Variety and GMO Experts, 1 GMO Expert and 1 SH Expert.

From the actual total number of auditors, in 2023 were approved 1 system auditor, 1 technical auditor and a GMO Expert and also two technical auditors decided to stop performing audits for ISTA.

The Accreditation and Technical Department has continued to recruit new contracted system and technical auditors to perform ISTA audits. Four candidates (1 System auditor, 2 Technical auditor and 1 SH Experts) were in different steps of the process.

3.7 Document updates

The revision of the ISTA Accreditation standard was finalised and the final draft was presented to ECOM during the February Meeting. The final format was approved in June, during the ECOM Meeting in Verona. The new revised ISTA Accreditation standard brings new aspects to be considered by the ISTA auditors and the audited laboratories such as machineries replacing the human analysts and risk assessment aspects.

All related documents of the Accreditation Department were revised to reflect the new policy approved by ECOM in February, for the Substantial and Non-substantial non-conformities identified during an ISTA audit. The implementation of the revised policy was implemented by all audited laboratories audited in 2023.

The Accreditation and Technical Department documents were revised for the changes in the ISTA Accreditation standard and prepared with the new ISTA Logo for celebration of 100 years of ISTA (to be used in 2024).

The ISTA crop groups were revised to add *Penisetum glaucum* under Cereals crop group as well (change valid from June 2023) and *Ricinus* in Other agricultural crop group (change valid from January 2024).

The design of the Accreditation Certificate and Certificate of appointment for the contracted auditors was changed considering the corporate identity.

3.8 Accreditation figures

A complete list of accredited ISTA laboratories is shown in Table B.3.18. The regional distribution of the accredited laboratories is given in Figures B.3.19 .

Table B.3.18 List of accredited laboratories – 2023

Country/Distinct Economy	ISTA Laboratory code
Argentina	AR01
Austria	AT03, AT04
Australia	AU01, AU02, AU06, AU07, AU09, AU13
Bangladesh	BD03
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, DE23
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, ID03
Ireland	IE01
Israel	IL01
India	IN05, IN06, IN07, IN12, IN14, IN16, IN39 IN45
Iran	IR01
Italy	IT01, IT03, IT06, IT07, IT09, IT10
Japan	JP01, JP03, JP05, JP06, JP07
Kenya	KE01
South Korea	KR02, KR03
Lithuania	LT01
Luxemburg	LU01
Latvia	LV01
Moldova	MD01
Malawi	MW01
Mexico	MX01
Netherlands	NL02, NL03, NL05, NL11
Norway	NO01
New Zealand	NZ01, 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
Türkiye	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	ZA03, ZA04, ZA05, ZA06
Zambia	ZM01
Zimbabwe	ZW01
Total number of accredited laboratories	151

There were 64 countries/distinct economies with at least one ISTA-accredited laboratory.

Six candidates for accreditation with the ISTA audit performed this year are in different steps of the accreditation process.

Figure B.3.19 Regional distribution of the 151 ISTA accredited laboratories

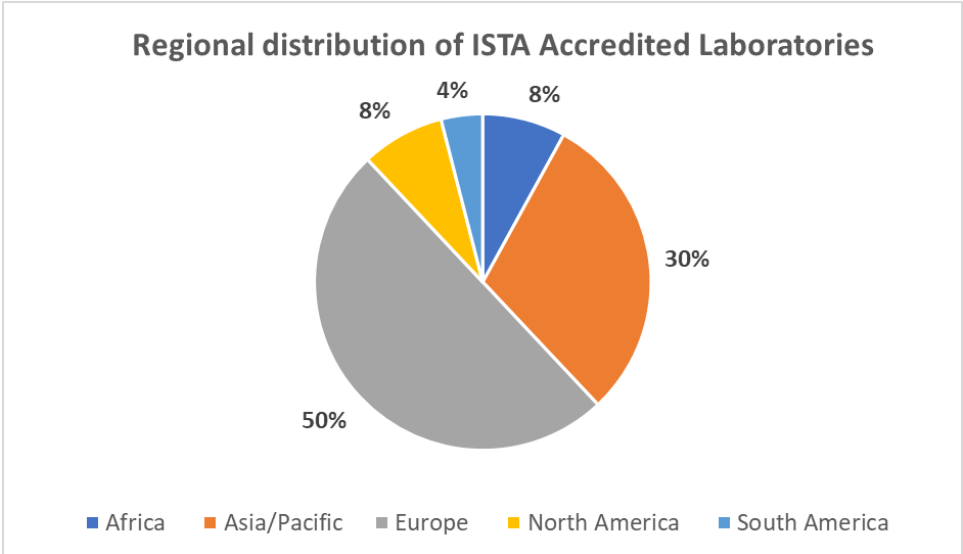


Figure B.3.20 Number of ISTA accredited laboratories since 2002

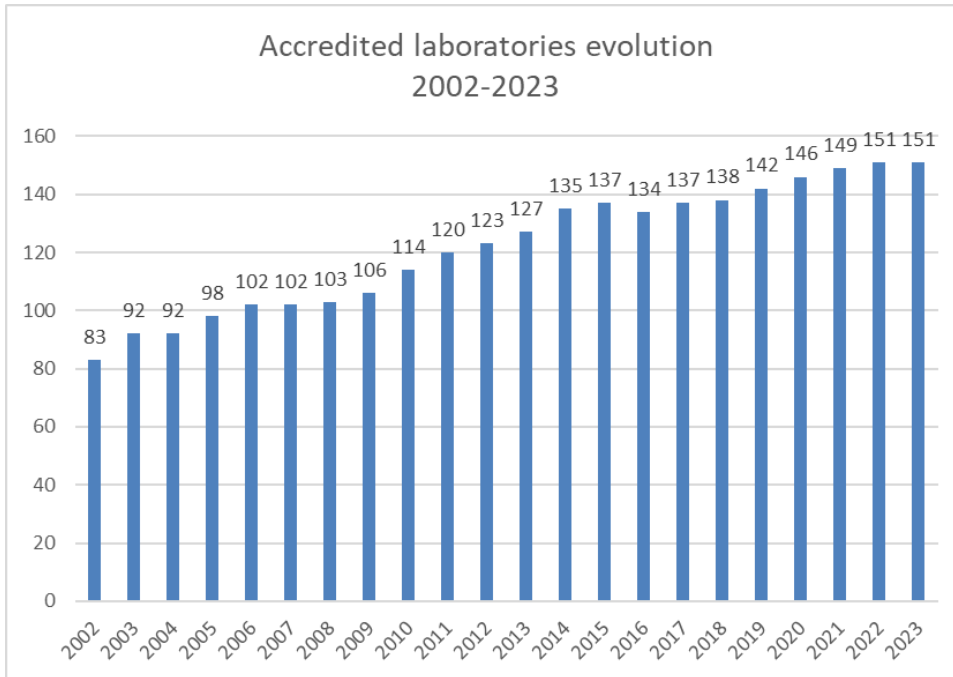
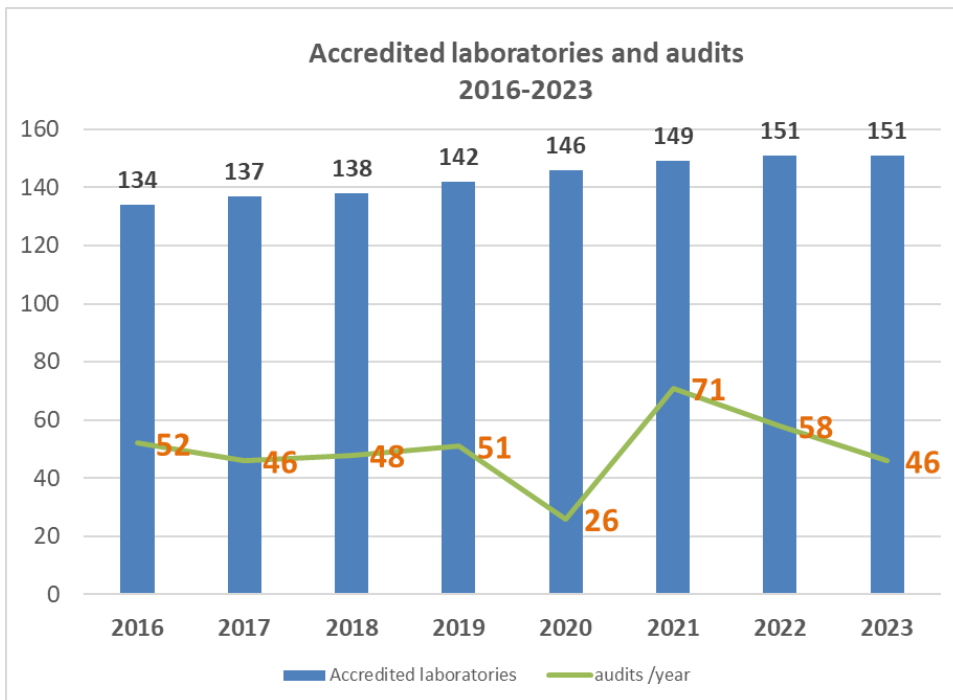


Figure B.3.21 Number of ISTA accredited laboratories and ISTA audits since 2016



Contribution of Accreditation Department team to:

- ECOM-VSI WG
- eCertificates Project
- ISTA Website update
- ISTA Secretariat QMS revision
- Certification surveillance audit
- Revision of the leaflet ISTA in Key figure 2023
- Revision of leaflet Guide to ISTA

Presence in social media:

ISTA Webinar on how to address the non-conformities identified at the ISTA audits – October 2023

International representations

- AFSTA Congress – Dakar, Senegal, participation of the Head of the Accreditation and Technical Department (HoAT) as invited speaker

Workshops

- Quality Assurance Workshops for beginners was organised in Hyderabad India – October 2023
- Basic Course In Seed Production, Certification, Sampling and Testing for Seed Quality Assurances – Dhaka, Bangladesh - the HoAT has been one of the lecturers
- The preparation of a Quality Assurance Workshop for advanced level planned for January 2024 in South Africa is almost finalised.

3.9 Sales of ISTA Certificates

A total of 211'000 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	2020	2021	2021	2022	2023
Orange International Seed lot Certificates	202500	181360	181360	189040	214500
Blue International Seed Sample Certificates	15400	18600	18600	9500	14100

4. ISTA Publications and Products

4.1 ISTA Handbooks and Proceedings

Table B.3.1. Total sales of ISTA publications 2019–2023

Type/year	2019	2020	2021	2022	2023
Handbook on Seed Sampling	6	0	7	36	40
Handbook on Seedling Evaluation	54	40	55	42	42
Handbook on Pure Seed Definitions	12	5	5	16	11
Handbook on Moisture Determination	11	4	7	9	24
Handbook on Flower Seed Testing	3	12	22	9	8
ISTA Working Sheets on Tetrazolium Testing Vol. I	4	1	9	11	8
ISTA Working Sheets on Tetrazolium Testing Vol. II	6	3	5	3	5
Various Handbooks/Publications	44	15	29	79	46
Total Publications sold	140	80	139	205	184

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 2023 2 samples of *Poa pratensis* and 5 of *Dactylis glomerata* were sold.

5. ISTA Training and Education Programmes

5.1 ISTA Workshop overview

In 2023, five physical workshops were held:

ISTA Workshop on Germination, 17 – 20 April 2023 – Chilanga, Zambia: 24 participants

ISTA Workshop on Tetrazolium Testing and Equilibrium Relative Humidity (eRH) Determination for Native Species – Peri, Italy: 24-25 May 2023: 15 participants, 26-27 May 2023: 19 participants

ISTA Workshop GMO, 2-3 June 2023 – Verona, Italy: 14 participants

ISTA Workshop on Germination, 4-7 September 2023 – Bucharest, Romania: 31 participants

ISTA Workshop on Quality Assurance 10-12 October 2023 - Dhaka, Bangladesh: 30 participants

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

Chief Editor:

Fiona R. Hay (Denmark)

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:

Irfan Afzal (Pakistan)

Christophe Bailly (France)

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

Laura Bowden (United Kingdom)

Seed quality, priming, storage

Ibrahim Demir (Turkey)

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

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

Andrea Mondoni (Italy)

Seed dormancy, germination, storage

Shyam S. Phartyal (Germany)

Sergey Rosbakh (Germany)

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

ECOM liaison officer

Ernest Allen

Title: Editorial Board of Seed Science and Technology; Fiona R. Hay (Chief Editor); <https://www.seedtest.org/en/tcom-edi.html>.

Brief Overview: Seed Science and Technology (SST) is ISTA's international journal featuring original papers and articles on seed quality and physiology related to seed production, harvest, processing, sampling, storage, genetic conservation, habitat regeneration, distribution and testing. The journal is a keyway in which ISTA meets its objective to actively promote research and dissemination of knowledge in seed science and technology. The Editorial Board is responsible for handling the reviewing process of papers submitted for publication and ultimately, deciding whether a paper should be published or not.

6.1 Editorial figures for 2023

Papers received: 85

Papers accepted: 38

Papers rejected: 47

Papers published (three issues): 37 + 3 editorial articles + 1 book review

Full papers in 3 issues: 6 + 6 + 6 = 18

Research Notes in 3 issues: 3 + 3 + 10 = 16

Invited review articles: 1 + 1 + 1 = 3

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

Pages published in 3 issues: 139 + 138 + 210 = 487

Average number of pages per paper: 11.9

6.2 Sales of 'Seed Science and Technology' 2019– 2023

	2019	2020	2021	2022	2023
SST Print	0	0	0	0	0
SST Online Single	1	0	1	0	0
SST Print+ Online single	0	0	0	0	0
SST Print+ Online Multiple	0	0	0	0	0
SST OnlineMulptle	0	0	0	0	0
SST Back Issues	1	0	0	0	0
SST Dowload of Individual Chapters	9	13	11	10	3
SST Open Access Fee Full Lengh Paper	11	12	15	0	10
SST Open Access Fee Research Note	11	10	3	0	11
Total SST	33	35	30	10	24

7. Seed Science Advisory Group

MEMBERSHIP LIST		
1	CHAIR: Brigitte Hamman	South Africa
2	VICE CHAIR: Alison Powell	United Kingdom
3	Birte Boelt	Denmark
4	Francoise Corbineau	France
5	Malavika Dadlani	India
6	Joel Lechappe	France
7	Tim Loeffler	United States of America
8	Stan Matthews	United Kingdom
9	Manuela Nagel	Germany
10	Alan Taylor	United States of America
11	Jane Thomas	United Kingdom
12	Adel Zayed	United States of America

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.

No research was identified that could be taken to relevant TCOMs for further investigation.

TOR 2: Appraisal of evidence for techniques/equipment available for use in seed testing laboratories

SeedAlive:

This approach uses seed leakage plus a colorimetric analysis and claims to predict seed germination and vigour. After the SSAG raised a number of questions about this approach during their presentation at the 2022 ISTA Annual Meeting, the Seedalive developers contacted us and provided further evidence in support of their approach, stating also that they were interested in validation of their method. The members of the SSAG have evaluated this additional evidence and provided a detailed response to the Seedalive. This was reported in in the 2022 Activity Report, and since then, there has been no further contact from SeedAlive.

The SSAG was not approached by any ISTA members to highlight equipment or new developments or technologies that need evaluation from a completely independent group such as the SSAG.

8. Wild Species Working Group

MEMBERSHIP LIST			
1	CHAIR: Gil Waibel	United States of America	
2	VICE CHAIR: Ruoqing Wang	Canada	
3	Riad Z. Baalbaki	United States of America	
4	Laura Bowden	United Kingdom	
5	Ted Chapman	United States of America	
6	Rachael Davies	United Kingdom	
7	Stefanie Krämer	Germany	
8	Heidi Larson	United States of America	
9	Sergio Pasquini	Italy	
10	Alison A. Powell	United Kingdom	
11	Victor Vankus	United States of America	
12	Fabricia Cristina dos Reis	Brasil	

The Wild Species Working Group is working to increase and organize the content intended to go into the web site. Additional programming is needed to present the data content efficiently and uniformly. This will help authors world-wide create new protocols for their species.

Images will appear as follows:



KEW (Millennium Seed Bank) has provided the data for germination protocols and thousand seed weights for many species that will help create the protocols. John Dickie, Racheal Davies, and Ted Chapman have supported us with this data.

The measurement bar and logo are additions to our image. While the use of our images is free for the public to use, ownership cannot be claimed by others. The logo helps show our ownership of the image. Many thanks to the Canadian lab (Taran Meyer and Roujing Wang) for photo-shopping these images for us.

Deborah Meyer has given much support and effort into aligning PSD and PSU seed unit descriptions. This was not an easy task and is now completed for all species in the priority list) which resulted from a survey sent out world-wide to assess goals for the Wild Species Working Group).

Many germination seedling descriptions (ISTA based) have been written by Sue Alvarez. Sue has also helped edit master list for matching PSU/PSDs to species and the master list for matching families/genera to seedling descriptions.

Michael Aberly has been working on the tetrazolium (TEZ) section, providing methodology and descriptions by family, explaining what constitutes viable and non-viable stained seeds.

Riad Baalbaki and Emi Kuroiwa are working on set of images of seedlings for each family showing normal and abnormal seedlings.

Laura Bowden has taken the lead on helping authors finish their methodology chapters.

Gil Waibel has taken thousands of images in over 150 families ready to be edited (copyright and web address added) and published.

Sergio Pasquini is an active member and the liaison office assigned to the Wild Species Working Group.

All of our working group members who are contributing suggestions and have attended our meetings.

It has taken many hours of effort to prepare content to help the programmers and web developers to finish our web site with an e-form to submit protocols and/or gallery images. They will need to find ways to store and manage our content to be used to help create a protocol for a species. It is expected we will be submitting protocols to the web site by our meeting in Cambridge this summer.

Submitted by: Gil Waibel (Chair) and Ruoqing Wang (Vice Chair)

9. Report of the ISTA Secretariat

9.1 Secretariat staff

This report lists the activities and changes in the Secretariat during 2023, where the Secretariat added one member of staff due to maternity leave of Neelam Ök:

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.

Thus, at the end of the year 2022 the Secretariat numerates the following 14 members of staff corresponding to 10.4 full time equivalent employees:

Role	Name	%FTE
Secretary General (SG)	Dr. Andreas Wais	1
Head of Accreditation and Technical Department / Deputy SG	Dr. Florina Palada	1
TCOM Manager	Nadine Ettl	0.6
TCOM Administration	Andreea Nicoleta Pinar	0.8

System Auditor, Quality Management & Standard PT Coordinator	Branislava Opra	1
System Auditor in training	Stella Marcu	1
Accreditation, Audit and PT Administration	Neelam Lagah	1*
Accreditation and Audit Administration	Beata Hübnerova	0.6
Finance, Sales and HR Management	Agnes Hegedüs	1
IT Business Solution Manager	Sejal Patel	1
Events, Membership and Documentation Manager	Olga Stöckli	1
Marketing & Communication Manager	Yoana Uzunova	0.6
Marketing & Communication Assistant	Karen de La Rosa	0.8
Cleaning	Ana Maria Ferreira	Hourly base

*Not counted as on maternity leave

9.2 Secretariat work

The Secretariat is located in Wallisellen (Richtiring 32, postal address Richtiarkade 18). The work of the Secretariat was not affected during the past year and the employees stay permanently with the Association. No staff turnover was 0 %, which added to the stability of the Association.

In 2023 the next stage of going paperless was achieved by implementing the online version of MS Navision (bookkeeping programme).

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. She also represents the employees in the pension fund.

Olga is responsible for the Events organisation, Administration documentation and all Membership administrations as well as to organise and monitor the Young@ISTA programme. 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 including the PL process for the Annual Meetings and Congresses. 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.

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. Agnes also oversees the time and holiday recording.

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.

Following the Office365 initiative and implementing the online version of the bookkeeping programme (MS Navision) in 2023 all bookkeeping is now completely virtual. This does not only save paper, but also shows clear benefits during auditing, as documents were exchanged easily.

9.3.4 IT

Computing hardware, connectivity and software is outsourced 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. In the area of Invoice preparations ISTA collaborates with Prisma, a company located in Zürich. The current website is hosted by MySign AG (maintenance of the website contents is done by the Secretariat staff).

A software change to Office365 (MS Teams) was completed in 2021. This process is ongoing and under the project management of Sejal Patel. Since 2021 ISTA also transferred this system as to be used by TCOMs, Special Project coordination, ECOM and other external cooperates (including auditors and audited laboratories/sampling entities) 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. A number of TCOMs make use of this by now. All special project coordination is done via Teams as well. As a non-profit organisation ISTA profits from special rates for all MS products.

ISTA uses LinkedIn learning as a tool for staff training in the Secretariat. LinkedIn learning is also under special rates for non-profit organisation.

In 2023 the move of MS Navision to a complete on-line version was completed.

9.3.5 Marketing

Social media and digital marketing

The ISTA YouTube channel has more than 1'720 subscribers, which is an increase of 32 % compared to last year. All relevant information are now posted here, and it became the main host for all ISTA video information as well as for posting the webinars. Further ISTA continued to use its X (formerly Twitter) account, which is used for quick information to the stakeholders and interested parties. ISTA has now about 2'550 followers on X, which is an increase of 28 % compared to last year. At the end of 2023, the ISTA LinkedIn profile counted nearly 11'400 followers, which is an increase of 11 % compared to last year. 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 X. The LinkedIn Young@ISTA forum has now 460 followers, which is an increase of 31 % compared to last year.

ISTA is also to be found on Wikipedia, which is giving information on all relevant topics (https://en.wikipedia.org/wiki/International_Seed_Testing_Association). This is maintained and updated frequently.

Newsletters to inform the membership are released every week (mostly on Wednesdays).

World Seed Partnership

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

- 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 2023 in order to move this project forward.

9.3.6 Representation

During 2023, 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 the African Union, AOSA/SCST, OECD, FAO, IPPC, ITPGRFA, NAPPPO, APSA, AFSTA, Euroseeds, UPOV and ASTA. There were also contacts with several DAs. The Secretary General is also member of the African Union Working group on seed quality and certification. Reports can be found in STI.

9.3.7 Event organisation

Decision was made by the ECOM to have the Annual Meeting in Verona, Italy, which allowed participation from a great number of ISTA member countries and distinct economies to participate in person.

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, 2023, 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.165 and no. 166) 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 the new ISTA website was completed by Yoana and Karen with the help of MySign.

Newsletters

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

9.3.9 TCOM

Nadine Ettel manages the TCOM work with the help of Andreea Pinar, this includes:

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

Coordination and administration of the Method Validation Programme.

Set-up and coordination of the 100K-project as well as the SH-project (Reference Pest List), which is coordinated by 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. In person workshops were started again in 2022. These may in future be combined by online workshops, where appropriate.

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

9.3.10 Accreditation

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

Auditing

Organised, arranged and partly performed by Florina, Branislava and Stella with support of Neelam and Beata, as well as a team of contracted system and technical auditors around the world with ISTA auditors also originating from areas, where is was not present before.

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 and Beata provide the Audits administration and Certificate shipment and administration.

Neelam and Beata are 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.

Organising 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
- Optimisation of the database

Certificates

Two projects are currently running concerning ISTA Certificates.

- eCertificates. 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 currently performed by 6 ISTA accredited laboratories. The system should be available to be used after the 2024 Annual Meeting as approved by the Ordinary General Meeting. 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 and is continuously updated.

10. Finances of the Association

In January 2024, 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 was higher than compared to previous year (+199'689 CHF). The income on Accreditation audits increased due to the number of audits performed in 2023 as well as due to the fact of more member laboratories being audited for the first time. This resulted in a higher income of 26'429 CHF. The commission of Certificates increased over the year, which is a result of the increase of commission price to 4 from 1 January 2024. The increase resulted in 113'100 CHF in 2023. The turnover increased to a total of 3'039'201 CHF for 2023, which is significantly higher than the 2023 budget (2'989'456 CHF), mainly for the reason of more Certificates being commissioned. The financial result shown for the year 2023 is negative. The balance of 1'821 CHF could only be reached by taking 270'000 CHF from the reserves, which is significantly lower than budgeted (445'000 CHF), and mainly due to foreign currency exchange rates at the End of 2023, where the CHF got massively stronger to other currencies, which therefore effected the ISTA funds of the reserves.

Some areas to highlight include:

Membership subscription: The increase of 4'125 CHF compared to previous year was mainly due to fluctuations and a less used option of the 10 % discount on on-time payments. This increase was 14'246 CHF higher than budgeted.

ISTA Annual Meeting & Congresses: The ISTA Annual Meeting was held in Verona, Italy. This resulted in income of 105'416 CHF and expenditure of 142'465 CHF. The expenditure was 10'917 CHF higher than the budget, whereas, the income was 22'034 CHF below budget, even including a sponsorship from CREA of 10'000€. The difference is reflecting that ISTA is covering the registration fees for TCOM Chairs and ECOM members.

ISTA Rules sales: Sales decreased marginally by 5'284 CHF compared to previous year, but stays stable around 50'000 CHF.

Accreditation: The reason for the higher income on audits of 26'429 CHF is mainly due to more new ISTA member laboratories were audited for the first time than budgeted. Expenditures did raise by 17'469 CHF, which is due to an auditor workshop being performed in December 2023. The expenditure was 66'299 CHF above budget, where the income was even 72'421 CHF above budget. The effect is described above.

Seed Science and Technology subscriptions: The income from sales and publication fees increased again as compared to previous year, where due to special promotions for publication no real income was generated in 2022. For 2023 we moved back to the similar income as in the past years (19'699 CHF).

For 2024 a balanced Zero budget is presented with using 134'574 CHF from the reserves, which is mainly due for eCertificates investment, which was approved by the OGM 2020 to be financed from the reserves, but will partly come from the cash flow as well.

The reserves decreased at end of 2023 by 270'000 CHF to be at 3'715'000 CHF, which is mainly due to foreign currency exchange rates at the End of 2023. This means that the 2023 budget could to a great extent be financed from the cash flow, which will be similar for 2024.

ISTA draft Budget 2024	2022	2023	Budget 2024	Proposed 2025
INCOME				
<i>Subscriptions</i>				
Annual Membership Subscription	1'249'610.80	1'253'735.68	1'258'414.58	1'265'000.00
Accreditation Subscription	170'136.00	171'861.31	179'144.64	180'000.00
Annual Meetings	66'638.85	105'416.23	164'700.00	145'000.00
Technical Committees WS	32'860.78	52'491.60	75'000.00	75'000.00
STI Advertisement	0.00	0.00	1'500.00	1'500.00
	1'519'246.43	1'583'504.82	1'678'759.22	1'666'500.00
<i>Service Centres</i>				
ISTA Rules	49'172.85	43'888.91	55'000.00	55'000.00
Accreditation Audits	614'704.00	641'132.95	665'008.10	665'000.00
Proficiency Test incl. GMO	12'000.00	7'000.00	16'000.00	15'000.00
QA Workshops	0.00	0.00	8'000.00	5'000.00
Seed Science and Technology	237.28	19'699.43	15'000.00	15'000.00
Technical Publications and calibration samples	50'725.04	33'720.53	30'000.00	30'000.00
Certificates	629'850.00	742'950.00	800'000.00	800'000.00
Website	0.00	0.00	0.00	0.00
	1'356'689.17	1'488'391.82	1'589'008.10	1'585'000.00
Losses in receivables	-36'424.00	-32'695.68	-15'642.00	-15'000.00
Total Income	2'839'511.60	3'039'200.96	3'252'125.32	3'236'500.00

ISTA draft Budget 2024	2022	2023	Budget 2024	Proposed 2025
EXPENDITURE				
<i>Direct Costs</i>				
Annual Meetings & Congresses	-129'644.28	-142'464.69	-190'875.00	-190'000.00
Executive Committee+President	-15'773.48	-64'408.68	-45'000.00	-45'000.00
Technical Committees WS and 3K grants	-114'500.03	-153'324.97	-206'500.00	-200'000.00
Seed Testing International	-30'520.57	-34'239.98	-33'000.00	-35'000.00
	-290'438.36	-394'438.32	-475'375.00	-470'000.00
<i>Service Centres</i>				
ISTA Rules	-6'602.96	-7'472.89	-13'000.00	-15'000.00
Accreditation Audits	-387'723.18	-370'253.97	-441'792.45	-400'000.00
Proficiency Test incl. GMO	-39'547.22	-67'694.10	-36'700.00	-40'000.00
QA Workshops	-2'335.97	-1'134.81	-8'000.00	-10'000.00
Seed Science and Technology	-60'410.47	-57'222.76	-60'000.00	-57'500.00
Technical Publications and calibration samples	-39'599.33	-13'972.11	-25'000.00	-25'000.00
Certificates	-229'136.75	-274'088.60	-70'000.00	-130'000.00
Provisions for fluctuations	585'000.00	270'000.00	134'574.41	96'000.00
	-180'355.88	-521'839.24	-519'918.04	-581'500.00
<i>Personnel expenses</i>				
Salaries	-1'215'118.25	-1'270'986.25	-1'282'178.67	-1'350'000.00
Social Security and insurances	-311'427.85	-334'416.20	-384'653.60	-405'000.00
Other personel expenses incl. Recruitments	-8'485.52	-7'841.60	-5'000.00	-5'000.00
Staff Training	-18'168.98	-29'601.87	-35'000.00	-35'000.00
Secretary General Cost	0.00	0.00	0.00	0.00
	-1'553'200.60	-1'642'845.92	-1'706'832.27	-1'795'000.00
<i>Operating Costs</i>				
Office Costs	-245'001.12	-307'805.77	-270'000.00	-270'000.00
Travel Costs (International Representation)	-41'028.35	-41'381.66	-45'000.00	-45'000.00
Sponsoring Projects (Young@ISTA)	-21'188.11	-20'620.36	-25'000.00	-25'000.00
Marketing Costs	-3'802.96	-4'250.46	-25'000.00	-10'000.00
Website	-88'364.28	-70'488.53	-40'000.00	-40'000.00
Projects	0.00	0.00	-170'000.00	-20'000.00
	-399'384.82	-444'546.78	-575'000.00	-410'000.00
Depreciation of tangible fixed assets	-15'900.00	-12'024.09	-10'000.00	-10'000.00
Financial costs	-541'505.80	-325'719.54	-55'000.00	-60'000.00
Financial income	75'836.79	215'313.42	90'000.00	90'000.00
Prior-period costs	-34'233.18	-24'179.46	0.00	0.00
Prior-period income	104'885.67	112'899.86	0.00	0.00
Total Expenses	-2'834'296.18	-3'037'380.07	-3'252'125.32	-3'236'500.00
Result	5'215.42	1'820.90	0.00	0.00

2023 YEAR END CLOSING	ACCOUNT 2021	ACCOUNT 2022	ACCOUNT 2023
ASSETS			
<i>Currents Assets</i>			
<i>Cash</i>			
Petty Cash (Accounts 1000,1001,1002)	4'905.58	10'377.85	7'329.79
Postal account (Accounts 1010,1011,1015,1016)	53'137.55	47'157.62	102'829.49
Zürcher Kantonalbank, current account (Account 1020)	2'524'680.23	2'500'758.02	1'627'475.44
Zürcher Kantonalbank, deposit account (Account 1021)	499'105.71	219'008.94	19'487.58
Zürcher Kantonalbank, USD account (Account 1025)	248'035.63	216'326.02	132'171.15
Zürcher Kantonalbank, EUR account (Account 1026)	860'674.29	648'794.96	606'457.82
Zürcher Kantonalbank, EUR account (Account 1030)	0.00	0.00	0.00
Zürcher Kantonalbank, GBP account (Account 1031)	52'909.40	8'108.69	64'300.05
Zürcher Kantonalbank, USD asset management account (Account 1055)	113'998.46	52'521.20	71'968.24
Money Market investments (Accounts 1405,1410)	0.00	0.00	1'000'000.00
	4'357'446.85	3'703'053.30	3'632'019.56
<i>Trade receivables</i>			
Membership subscriptions, certificates and publications (Accounts 1100,1111,1112,1113)	56'241.66	25'559.80	112'561.97
Allowance on doubtful accounts (Account 1120)	-5'600.00	-18'000.00	-15'200.00
	50'641.66	7'559.80	97'361.97
<i>Other accounts receivable</i>			
Other accounts receivable (Account 1108,1109,1110,1135,2320)	17'801.21	0.00	0.00
Withholding tax (Account 1150)	2'608.44	547.56	1'644.12
Value added Tax (Account 1155,1156,1157,2055,2057)	69'765.59	116'433.63	23'023.59
	90'175.24	116'981.19	24'667.71
<i>Accrued income and prepaid expenses</i>			
Prepaid expenses (Accounts 1300)	74'933.35	343'072.62	281'574.73
	74'933.35	343'072.62	281'574.73
<i>Fixed assets</i>			
Financial assets (Accounts 1400,1420)	2'852'370.51	2'487'490.95	2'421'116.62
Tangible fixed assets (Accounts 1500,1520)	63'000.00	47'100.00	36'000.00
	2'915'370.51	2'534'590.95	2'457'116.62
	7'488'567.61	6'705'257.86	6'492'740.59

2023 YEAR END CLOSING	ACCOUNT 2021	ACCOUNT 2022	ACCOUNT 2023
LIABILITIES + EQUITY			
<i>Short-term liabilities</i>			
Trade creditors (Account 2000,2001,2002,2005,2006,2007)	-224'126.00	-110'040.86	-144'068.54
Other accounts payable (Accounts 2200,2220,2250,2260,2270,2280,2321)	-3'959.25	-7'352.05	-7'778.35
Advance payments (Accounts 2100,2101,2102,2103,2104,2106,2107,2108,2109,2110,2112)	-1'559'493.25	-1'536'120.71	-1'533'784.64
Accrued expenses (Accounts 2120,2121,2122,2123,2124,2125,2126,2127,2128,2129,2130,2131)	-198'982.61	-129'522.32	-153'066.24
	-1'986'561.11	-1'783'035.94	-1'838'697.77
<i>Long-term liabilities</i>			
Provisions (Account 2910)	-4'570'000.00	-3'985'000.00	-3'715'000.00
	-4'570'000.00	-3'985'000.00	-3'715'000.00
<i>Equity</i>			
Equity (Account 2800)	-926'102.66	-932'006.50	-937'221.92
Profit/Loss (Account 2998)	-5'903.84	-5'215.42	-1'820.90
	-932'006.50	-937'221.92	-939'042.82
	-7'488'567.61	-6'705'257.86	-6'492'740.59



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CH-8031 Zurich

To the Executive Committee of
ISTA International Seed Testing Association
Richtiarkade 18
8304 Wallisellen

Zurich, 9 February 2024
2110 0520/DSH/BRS

Management letter concerning the audit (Limited statutory examination) of the 2023 annual financial statements

Dear Members of the Executive Committee

On January 25, 2024 we have conducted the audit of the 2023 annual financial statements (balance sheet, profit and loss account and notes) of ISTA International Seed Testing Association at the offices of the association. At the final audit meeting, we discussed our audit findings with Dr. Andreas Wais and Mr. Ronny Dossenbach (Buff Treuhand AG).

General Audit Findings

All financial information has been made available to us in an organized and efficient manner.

Individual Audit Findings

Profitability 2023

The 2023 financial year reported earnings, changes in hidden reserves and net loss are as follows:

Reported profit of 2023 financial year (external)	CHF	1'821
Decrease in provisions	CHF	-270'000
Loss 2023 financial year (internal)	CHF	-268'179

BDO Ltd, a limited company under Swiss law, incorporated in Zurich, forms part of the international BDO Network of independent member firms.

C. Reports of the Technical Committees

You will find on the following pages the reports of the Technical Committees for the calendar year 2023. 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 of America	
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	Tomoko Sakata	Japan	
13	Sebastian Bobber	Germany	
14	Giovanny Lopez	Netherlands	
15	Sunmeet Bhatia	New Zealand	
16	Ganesh Kumar	United States of America	
	Mieczyslaw Grzesik	Poland	Retired
B. PUBLICATIONS			
B1. Publications to accompany the Rules			
	Publication title	proposed finalisation	collaboration
			remarks
			update
			progress
1	<u>X-ray Chapter 14 of the Rules Complete update of the chapter</u>	<u>2023</u>	<u>PUR, ATC, FSC</u>
			<u>Finalised</u>
B3. Scientific information publications			
	Publication title	proposed finalisation	collaboration
			remarks
			update
			progress
1	ATC Web-pages		Content to be added continuously
2	Advanced Technologies Committee (report)		Bert van Duijn (Chair) and Francisco G. Gomes Jr (Vice-Chair) Seed Testing International No. 166, October 2023 pp. 34-35
3	Overview of all image forming technologies and their application to seeds	Continues	Presented (partly) at different meetings. In prep for web publication.
4	ISTA's First Scientific Writing Workshop 1 November 2022, Athens.	2023	Sunmeet Bathia, Kalomaira Delga, Sebastian Bopper and Marie-Hélène Wagner (ATC and VIG) Seed Testing International No. 165, April 2023 pp. 51.
5	Concluding paper on Exploration of Methods	2023	SHC, ISTA Special project 20-1: Exploration of Methods for Seed Testing International

	for Detecting Insects in Seed Lots.		Detecting Insects in Seed Lots.	
6	Summary and Recommendations from ISTA Special Project 19-1: Application of Marketplace Available Technologies of Computer Vision in Seed Testing	2023	Ruojing Wang, Liang Zhao, Bert van Duijn (PUR and ATC)	Seed Testing International No. 165, April 2023 pp. 21-24.
7	Chapter X-ray imaging in "Handbook of Tree and Shrub seed testing"	Postponed	Tree and Shrub Seed Committee	
8	Valorization of sorghum ash with digestate and biopreparations in the development biomass of plants in a closed production system of energy	2023	Z. Romanowska-Duda, Regina Janas, Mieczyslaw Grzesik (ATC) Bert van Duijn (ATC)	October 2023 Scientific Reports 13(1) DOI: 10.1038/s41598-023-45733-9
9	A chemometric method for the viability analysis of spinach seeds by near infrared spectroscopy with variable selection using successive projections algorithm	2023	Madan Kumar Lakshmanan, Birte Boelt (ATC) and Rene Gislum	Journal of Near Infrared Spectroscopy 2023, Vol. 31(1) 24–32. DOI: 10.1177/09670335221138955
10	Application of gas discharge visualisation technique for seeds hidden defects evaluation.	2023	PRIYATKIN N.S. (ATC) et al.	Theoretical and Applied Ecology. - 2023. No.3. - P. 37–48. DOI: 10.25750/1995-4301-2023-3-037-04
11	Evaluation of heterogeneity and hidden defects of wheat (<i>Triticum aestivum</i> L.) seeds by instrumental physical methods.	2023	PRIYATKIN N.S (ATC) et al.	Sel'skokhozyaistvennaya Biologiya [Agricultural Biology], 2022, Vol. 57, № 5, p. 911-920. doi: 10.15389/agrobiology.2022.5.911eng
12	X-ray and Micro-CT image analysis of soybean seeds in relation to the Tetrazolium Test.	2022	Martinez, M.A. (ATC); Arango Perearnau, M.R.; Andretich, G.; Peralta, M.; Airaldo, G.; Gallo, C.	ISTA Seed Symposium Athens, Greece.
13	Chlorophyll retention and low oxygen consumption rates in soybean seeds produced under heat-drought stress.	2023	Martinez, M.A (ATC)Montechiarini, N.H.; Gosparini, C.O.; Oppedijk, B.; van Duijn, B. (ATC)	XXXIV Argentinian Meeting of Plant Physiology (RAFV 2023), Rosario, Argentina.
14	The influence of seed moisture content on the results of the Radicle Emergence test of rapeseed (<i>Brassica napus</i>)	2023	Bopper, S. (ATC)), Goertz, S, Zur, J. and M. Kruse	Seeds" 134th VDLUFA Congress. Page https://www.vdlufa.de/wp-content/uploads/2023/08/Kurzfassungen.pdf

C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	Workshop on Imaging technologies for seed evaluation, Italy	June 2024	Italy	To be confirmed
2	Workshop on Methods for insect detection in seeds (related to ISTA special project 20-1)	January 2024	SHC, France	
3	Workshop Imaging in seed quality assurance workshop	November 2023	New Zealand	Postponed
4	Workshop Imaging in seed quality assurance	Spring 2024	Hyderabad, India	
C2 Seminars				
				remarks
	Seminar subject	proposed	collaboration	update
	location	finalisation		progress
1	Seminars on advanced seed technologies	October/November 2024	Hangzhou	
2	Seminar/interest meeting on Mathematical modelling in seed testing	May 31, 2023	Statistics committee	At the ISTA annual meeting in Verona
3	Report lecture/discussion: Insect detection in seed	May 31, 2023	SHC	At the ISTA annual meeting in Verona
4	Emerging trends and future outlook of modern technologies in seed quality testing. Bert van Duijn (ATC)	October 4, 2023	FAO	Joint FAO/ISTA Webinar: New Technologies in Seed Testing
5	Seed moisture testing. Kent Bradford (ATC)	October 4, 2023	FAO	Joint FAO/ISTA Webinar: New Technologies in Seed Testing
6	Adoption of modern seed testing technologies across the world and how to address the capacity needs and gaps in different countries. Aurelie Charrier (ATC)	October 4, 2023	FAO	Joint FAO/ISTA Webinar: New Technologies in Seed Testing
7	ISTA technical projects – purity by number and insects. Birte Boelt (ATC)	March 6-7, 2023		DanSeed Symposium 2023, Kobæk Strand Conferencecenter, Denmark.
8	Electrophotography is a promising method for seed quality assessment. Nikolay Priyatkin (ATC)	October 16-19, 2023		The fifth international conference with tutorial day "Physics for Life Sciences", St. Petersburg, Russia

9	Forum on New Technologies in Seed Testing. Francisco Gomes jr (ATC), Ganesh Kumar (ATC)	November, 2022		ISTA SEED SYMPOSIUM IN ATHENS, GREECE
10	Seed priming: practical commercial use and its evaluation. Tomoko Sakata (ATC)	November 29, 2023	ISSS	ISSS-ISTA webinar for 'Seed priming'
D. Proficiency Tests				
	Proficiency Test Subject	proposed	collaboration	remarks update progress
		finalisation		

1.

E. QUESTIONS TO THE COMMITTEE				
	subject of question			from
1.	References on Advanced Technologies	November 2023		Hugo Wilson, NSP FAO
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	2023		For new ISTA web pages
3	Mathematical modelling in seed testing	2023	Statistics committee	Joint Working group established
4	Finding new technologies	continuous		
5	Imaging in Tree and Shrub seed testing"	2023	Tree and Shrub Seed Committee	On going
6	New Technologies for Other Seeds Determination	2022	PUR	ISTA sponsored special project
7	Assessment on available technologies of imaging and image analysis for other seeds determination (OSD), purity analysis and germination.	2023	PUR, GER	ISTA sponsored special project

8	Exploration of methods for detecting insects in seed lots	2023	SHC	ISTA sponsored special project
9	Exploring central depository for images of Physical Purity	2023	STA	Initiative in partnering Ganesh Kumar (ATC Lead) Shankara Naika, Bruno Zaccomer, Kirk Remund (STA) , Birte Boelt (STA), Jens Michael Carstensen

2. BSC Bulking and Sampling Committee

COMMITTEE MEMBERSHIP LIST				
				change comments
1	Chair: Corinne Guimier	France		
2	Vice-Chair: Eddie Goldschagg	South Africa		
3	Ignacio Aranciaga	Argentina		
4	Chandrashekara Bhat	India		
5	Lotta Claesson	Sweden		
6	Gerry Hall	United Kingdom		
7	David Johnston	United States of America		
8	Birte Krogh	Denmark		
9	Michael Kruse	Germany		
10	Bülent Öztürk	Turkey		
11	José Maurício Pereira	Brazil		
12	Leena Pietilä	Finland		
13	Cza Realubit	The Philippines		
14	Justin Salter	New Zealand		
15	Evans Tembo	Zambia		
	Steve Jones (ECOM Liaison)	Canada		
A. RULES DEVELOPMENT				
<u>A1. Introduction of New Methods</u>				
	Method name	proposed	collaboration	remarks
	subject	finalisation		update progress
1	Sampling for dust-like species	2024	PUR, RUL, STA	First proposal removed in 2022, further consideration – theoretical statistic study planned
2	Validation of the tube trier			Working group in progress
3	Sample and Lot Weight determination for new species in ISTA Rules	2023	PUR, STA	Rule change submitted by PUR committee – voted for ISTA Rules 2024
4	Sampling conditions for issuing OICs when ISTA methods are described only for untreated seeds	2025		First draft: list of questions, to be completed
<u>A2. Introduction of New Species</u>				
	Species and test	proposed	collaboration	remarks
		finalisation		update progress
1				
<u>A3. Introduction of Rules Changes</u>				

	Subject	proposed finalisation	collaboration	remarks update progress
1	Number of sub-lot certificates	2023	ISTA WG VSI, ISF Veg WG	Rules proposal for Tomato seed lots in discussion with ECOM – voted for ISTA Rules 2024
2	Size of submitted and working samples for vegetable seeds		ISTA WG VSI, ISF Veg WG	
3	Merging of table 2c part1, part2, part3 in one table 2C	2024	MOI	Submitted for vote in 2024
	Various corrections/updates in chapter 2	2025		Working group scheduled
B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
	Publication title	proposed finalisation	collaboration	remarks update progress
1	ISTA Handbook on Seed Sampling – Spanish translation	2022		Published (summer 2023)
2				
<u>B2. Training publications on specific seed testing topics</u>				
	Publication title	proposed finalisation	collaboration	Remarks Update Progress
1				
<u>B3. Scientific information publications</u>				
	Publication title	proposed finalisation	collaboration	remarks update progress
1				
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject location	proposed finalisation	collaboration	remarks update progress
1	ISTA Quality Assurance workshop – Advanced level – Sampling part	2024	ISTA Accreditation and Technical Department	23-26.01.2024, Oudtshoorn, South Africa
2	Webinar about monitoring – Samplers monitoring	2024	ISTA Accreditation and Technical Department	Scheduled in March 2024
3	Sampling workshop for tree species, Brazil	2025?	FTC	according to the needs of FTC
D. Proficiency Tests				
	Proficiency Test Subject	proposed finalisation	collaboration	remarks update progress

1.				
E. SPECIAL PROJECTS				
	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
1	Further development of training videos	Ongoing		In progress: definition of priority topics
2	Further development of the sampling calculator, further translations	Ongoing		According to the needs
3	Contribution to the new working group on tropical species		PUR, GER, TEZ, FTC	Participation to the first meeting on 21.12.2023
F. QUESTIONS TO THE COMMITTEE				
	subject of question			from
				country
1	use of sampling tools			Bangladesh
2	typing error in Handbook (5.2.2)			Japan
3	presentation: relation the seed lot / sample taken / result on ISTA Certificate			Switzerland
4	calculation for 20 000 packets of 30g compared to sampling calculator			United States of America
5	disinfection of Nobbe triers			Czech Republic
6	check of dividers; pooling of samples from different lots for seed health test			Switzerland
7	seed lot size expressed only by number of seeds - on OIC and BIC			Argentina
8	return seeds after testing, except 25			Accreditation Dept
9	repacking of seed lot from a container to bags			France
10	rules proposal on number of sublots: examples, clarification			United States of America
11	rule 2.5.2.2.4 hand halving method			Australia
12	sampling for lots with different packaging sizes			?
13	date of Rule change for seed lots size for perennial ryegrass from 5,000 kilos to 10,000 kilos (before 1985)			New Zealand, via ISTA Secretariat
14	sampling calculator: no reference to large seed lots for sampling on seed stream			Denmark
15	new version of Handbook: identification of changes			Japan
16	maximum lot size for <i>Triticum</i> sp. or <i>Oryza sativa</i> seed lots			Iran
17	possibility to reduce the sample size for germination test at the point of entry into the country, hybrid seeds of high value			Pakistan, via ISTA secretary General
18	new version of Handbook: identification of changes			Germany
19	authorisation to use tables and figures from the Handbook for samplers training and sampling manual			Norway, via ISTA secretariat
20	dividers for encrusted seed			Greece
21	approval of automatic samplers: ISTA approval needed?			Hungary
22	number of containers of a seed lot for vegetables (boxes of small containers)			Accreditation Dept
23	historical reasons for sampling intensities			ISTA President and Secretary General
24	repacking of seed lot and number of bags on the IOC			Poland

25	calculation of coefficient of variation (CV) for samples	Japan, via PUR
26	approval of automatic sampler for another species	Slovak Republic
27	reporting on an OIC: number of containers, seal of the lot, lot number	Netherlands
28	example/retaining material on sublots	United States of America
29	statistics used for sampling	Australia
30	vacuum samplers for seed testing	United States of America
31	reconditioning a lot and sampling for OIC	Italy
32	size of box for composite sample for automatic sampling	United States of America
33	sampling before packing in different container types; information on OIC	Thailand
34	seed lot size for pelleted seeds, and unit used (kg, KS)	ISTA auditors
35	send back to the applicant seed from submitted sample not used in working sample	Iran
36	number of species in ISTA Rules (for a brochure on 'ISTA Key Figures')	ISTA Secretariat
37	sampling calculator wording in Danish	Denmark
38	submitted sample is the whole lot	ISTA Secretariat
39	submitted sample size if no OSD size is no OSD size is in table 2C; sampling before packaging	ISTA auditors
40	coated seeds (with photo)?	ISTA auditors
41	reporting on an OIC: species name when only the genus name is in table 2C	ISTA auditors
42	automatic sampling, falling distance for the sample and for the seed flow (seed flow not direct)	ISTA auditors
43	automatic sampler: is the complete seed stream sampled?	ISTA auditors
44	precision on sampling on seed streams	Argentina
45	treated seeds: incrustated or pelleted?	ISTA auditors
46	tins/sachets in boxes: possible to stop using labels to seal the boxes after analysis?	the Netherlands
47	spiral trier for sees small than whet: why?	The Czech Republic
48	why is there a difference between the maximum number of pellets and the lot size for encrusted seed?	ISTA auditors
49	possible to sample on the stream not entering a container?	ISTA auditors
50	submitted sample weights for seed mixtures	South Africa
51	Juglans listed in 2.5.2.2.4 but not in table 2C	The Czech Republic
52	changes on ISTA Certificate for variety name possible?	Denmark

- New project
- New proposed finalisation date

3. FSC Flower Seed Committee

COMMITTEE MEMBERSHIP LIST			
		Country	change comments
1	Sarah Dammen (Chair)	United States of America	New chair
2	Meriam Dekalo Karen (Vice Chair)	Israel	New vice-chair
3	Rachael Davies	United Kingdom	
4	Sylvie Ducournau	France	
5	Erik van Egmond	Netherlands	
6	Stefanie Kramer	Germany	
7	Shizka Takeuchi	Japan	
8	Lucele Pretorius	South Africa	
9	Zita Ripka	Hungary	Left committee due to retirement
10	Maria Marin	Croatia	
11	Alessandra Barbante	Italy	
A. RULES DEVELOPMENT			
<u>A1. Introduction of New Methods</u>			
	Method name	proposed	collaboration remarks update
	subject	finalisation	progress
1	Add 25C to rules for Begonia spp.		(Shizka Takeuchi)
<u>A2. Introduction of New Species</u>			
	Species and test	proposed	collaboration remarks update
		finalisation	progress
1			
<u>A3. Introduction of Rules Changes</u>			
	Subject	proposed	collaboration remarks update
		finalisation	progress
1	Sample size for flower species (Table 2A part 3)	On-going	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)
B. PUBLICATIONS			
<u>B1. Publications to accompany the Rules</u>			
	Publication title	proposed	collaboration remarks update
		finalisation	progress

1				
	<u>B2. Training publications on specific seed testing topics</u>			
	Publication title	proposed	collaboration	remarks update
		finalisation		progress
1	Collaboration in the project of the website TSWS (Testing Seeds of Wild Species): wild flower species		WS	In progress (R. Davies)
2	ISTA Handbook on Flower Seed Testing	2024	GER	Evaluate pages that are in progress and what is needed to complete these pages. (Sylvie Ducournau and Sarah Dammen)
	<u>B3. Scientific information publications</u>	-	-	
	Publication title	proposed	collaboration	remarks update
		finalisation		progress
1				
	C. WORKSHOPS AND SEMINARS			
	<u>C1. Training and education workshops</u>			
	workshop subject	proposed	collaboration	remarks update
	location	finalisation		progress
1				
	<u>C2. Seminars</u>			
	Seminar subject	proposed	collaboration	remarks update
	location	finalisation		progress
1				
	D. Proficiency Tests			
	Proficiency Test Subject	proposed	collaboration	remarks update
		finalisation		progress
1	ISTA PT Programme 2022/25	2023	PTC	Matthiola longipetala GER
	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)	2023-25	PUR -PTC	Ongoing (S. Takeuchi)

2	Collaboration with AOSA: comparison of species listed in AOSA and ISTA Rules	2024	AOSA	Comparison was made on Germination and purity rules of ISTA and AOSA. (S. Dammen)
3	Collection of information about Flower seed Testing by ISTA laboratories	2024		To be started (Alessandra Barbante)
4	Inventory of TZ methods used by the laboratory for flower species	2022	TEZ	To be started (S. Kramer, TBD)
	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	United States of America	
3	Magdalena Beza	Poland	
4	Lena Bezděčková	Czech Republic	
5	Valerie Blouin	France	
6	Marija Gradecki-Postenjak	Croatia	
7	Dave Kolotelo	Canada	
8	Geângelo Calvi	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	
14	Sergio Pasquini	Italy	
A. RULES DEVELOPMENT			
A1. Introduction of New Methods			
			remarks
	Method name	proposed	collaboration
	subject	finalisation	update
2	Validation of germination tests for <i>Khaya grandifoliola</i> and <i>Khaya senegalensis</i>	2024	progress Leader: Elisa Vieira Seeds will be harvested in February-March and will be sent to the laboratories.
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
1				
B3. Scientific information publications				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	OECD Forest Seeds and Plant Scheme Meeting – Slovakia 2023	2023		Article published in Seed Testing International, no. 166, October 2023.
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				remarks
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	Participation in the OECD Forest Seed Scheme meeting, Paris-France	September 2023		Edoardo Vincenti participation, as he is the FTSCom representative in OECD.
2	Participation in the ISF-TAS meeting,	August 2023		Edoardo Vincenti participation.
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

1	Forest and Shrub Seeds E-Handbook	2024-2025	The committee members that agreed to contribute are organizing the information to which genera they chose. Some modification is been done in the Joomla system to adequate the new information that will be uploaded.
F. QUESTIONS TO THE COMMITTEE			
	subject of question		from country
1	Germination test methodology for 22 african tree species		South Africa
2	Germination test methodology for <i>Adesmia argyrophylla</i> , <i>Heliotropium filifolium</i> , <i>Heliotropium floridum</i> and <i>Balbisia peduncularis</i>		Chile
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	Ignacio Aranciaga	Argentina	
4	Janek Bartel	Canada	
5	Sarah Dammen	United States of America	
6	Gillian Durrant	United Kingdom	
7	Meriam Dekalo-Keren	Israel	
8	Sylvie Ducournau	France	
9	Lesly Gonzalez	Chile	
10	Aidin Hamidi	Iran	
11	Andrea Jonitz	Germany	
12	Augusto Martinelli	Argentina	
13	Takayuki Okuda	Japan	



14	Elena Perri		Italy	
15	Dot Vittrup Pedersen		Denmark	
16	Melissa Phillips		United States of America	
17	Erik van Egmond		Netherlands	
A. RULES DEVELOPMENT				
<u>A1. Introduction of New Methods</u>				
				remarks
	Method name	proposed	collaboration	update
	subject	finalisation		progress
1	Consider more efficient methods to break sunflower (<i>Helianthus annuus</i>) seed dormancy	2025		Preliminary work reported by Sylvie Ducournau. A comparative test is planned in 2024 to test more efficient dormancy breaking treatments led by Audrey Dupont.
2	Work on optimal germination conditions for sunflower (<i>Helianthus annuus</i>) confection seeds	2025		Work programme still to be considered.
3	Addition of dormancy breaking methods for <i>Cannabis sativa</i> (hemp)	2025	AOSA/SCST and CFIA	This work is at an early stage and will be taken forward by Ruoqing Wang when time is available.
4	Addition of 20°C for <i>Solanum tuberosum</i>	2025	Netherlands Industry/ Secretariat	Erik van Egmond had preliminary discussions with Netherlands Potato Seed Industry. May be difficulty in obtaining true potato seeds for testing and potential phytosanitary issues.
5	Maize (<i>Zea mays</i> L.) secondary root system seedling evaluation criteria for classifying a seedling as normal.	2025		Aidin Hamidi & Marija Milivojevic working on a proposal to improve root evaluation criteria.
<u>A2. Introduction of New Species</u>				
				remarks
	Species and test	proposed	collaboration	update
		Finalisation		progress
1	Introduction of <i>Diplotaxis</i> spp.	2024	STAT, BSC PUR	Leader: Erik van Egmond. Germination samples sourced and to be sent to participants in February 2024.
2	Introduction of a germination method for Dwarf Saltwort (<i>Salicornia bigelovii</i> Torr. and <i>Salicornia persicum</i>)	2025	STA, BSC, PUR	Leader: Aidin Hamidi. Preliminary study examining suitable germination methods completed. Further information to be provided. May have difficulty in getting seed lots.
3	Introduction of a germination method for	2025	STA, BSC, PUR	Leader: Aidin Hamidi. This study is ongoing. Further information to be provided.

	Saatar (<i>Zataria multiflora</i> Boiss.) and Camelthorn (<i>Alhagi camelorum</i> F.).			A Method Validation Study may start in 2024 for Camelthorn.
4	Introduction of <i>Moringa oleifera</i>	2024	BSC, PUR, TZ, MOI, NZ Lab	Leader: Craig McGill. Preliminary work in progress to find suitable germination methods before Method Validation Study starts.
	<u>A3. Introduction of Rules Changes</u>			
	Subject	proposed	collaboration	update
		Finalisation		progress
1	Review of retesting when fresh seed is present (ISTA Rules Section 5.7a)	2023	RUL	Rule proposal submitted for 2023 Annual Meeting and accepted.
2	Review of Chapter 11 (germination) considering reporting requirements	2023	RUL	Rule proposal submitted for 2023 Annual Meeting and accepted.
3	Review of Chapter 13 (germination) reporting results	2023	RUL	Rule proposal submitted for 2023 Annual Meeting and accepted.
4	Pre-washing of <i>Beta</i> seeds	2024	RUL	Rule proposal submitted for 2024 Annual Meeting. Leader: Lesly Gonzalez. Method Validation Study completed.
5	Expand the list of Families in the ISTA Rules (5.2.10.1) that have hard seeds	2024	RUL	Rule proposal submitted for 2024 Annual Meeting.
6	Merger of Table 5A Part 1 and Part 3 into Table 5A Part 1	2024	RUL	Rule proposal submitted for 2024 Annual Meeting.
7	Additional advice of "low moisture level advisable" for testing <i>Spinacia oleracea</i> to be added to Table 5A, Part 1.	2024	RUL	Rule proposal submitted for 2024 Annual Meeting.
	<u>B2. Training publications on specific seed testing topics</u>			
	Publication title	proposed	collaboration	update
		Finalisation		progress

1	ISTA Handbook of Seedling Evaluation (Spanish Version)	2024	Secretariat	Leader: Augusto Martinelli. The Handbook is in the final stages of being translated into Spanish and will be completed in 2024.
2	ISTA Workshop on Germination Testing, Chilanga, Zambia	2023		Leaders: Augusto Martinelli and Melissa Phillips. Article written for Seed Testing International published in October 2023.
3	ISTA Workshop on Germination Testing, Bucharest, Romania	2024		Leaders: Augusto Martinelli and Janek Bartel. Article written for Seed Testing International to be published in April 2024.
4	Study on the influence of the substrate water level for germination on <i>Spinacia oleracea</i>	2023		Leader: Takayuki Okuda. Follow up work from ISTA PT22-2 <i>Spinacia oleracea</i> examining different levels of water added to the substrate during germination tests. Article written for Seed Testing International to be published in April 2024.
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject	proposed	collaboration	update
	location	finalisation		progress
1	ISTA Workshop Germination - Zambia	April 2023		Leaders: Augusto Martinelli and Melissa Phillips. Complete.
2	ISTA Workshop on Germination - Romania	September 2023		Leaders: Augusto Martinelli and Janek Bartel. Complete.
3	ISTA Workshop Purity & Germination – Kyiv, Ukraine	TBD	PUR	Currently on hold. May try to go ahead with online workshop.
4	ISTA Workshop on Germination & Tetrazolium - New Zealand	May 2024	TZ	Leaders: Augusto Martinelli and Sergio Pasquini. Delayed from November 2023.
5	ISTA Workshop Purity, Germination and Moisture Committee - Iran	TBD	PUR MOI	Currently on hold. May need to consider an online workshop.
D. PROFICIENCY TESTS				
Proficiency test subject				
	PT information	finalisation		progress
1	22-3 <i>Lolium perenne</i>	2023	PTC	Completed

2	23-1 <i>Vicia villosa</i>	2023	PTC	Completed
3	23-2 <i>Raphanus sativus</i>	2023	PTC	Completed
4	23-3 <i>Trifolium hybridum</i>	2024	PTC	Samples shipped to laboratories.
E. SPECIAL PROJECTS				
project title / subject				
collaborating committees		proposed	collaboration	update
		finalisation		progress
	Update Seedling Images for Handbooks and Training as a basis for regular image collection (ISTA Special Project)	2023	Secretariat	Leader: Janek Bartel. Images approved by majority vote of Germination Committee. Completed.
F. QUESTIONS TO THE COMMITTEE				
subject of question				from
				Country
1	Retesting procedures 5.7f			Argentina
2	Lighting requirements			Denmark
3	Method for true potato seed needs updated			Netherlands
4	Temperatures for germination and using Table 5A			United Arab Emirates
5	Seedling evaluation of <i>Bituminaria bituminosa</i> (not in ISTA rules) & advice on root evaluation			Australia
6	Counting normal seedlings during evaluation			Denmark
7	Coated seed germination			USA
8	Use of different growing media at 5.4.1 of the rules			Italy
9	Use of codes in germination testing for abnormal seedlings			Poland
10	Germination testing temperatures			Denmark
11	Classification of abnormal seedlings in <i>Lolium</i> sp.			Australia

12	Phytotoxicity testing		Switzerland
13	Germination methods		Chile
14	Water retention checking of media		USA
15	Measuring temperature at substrate level for prechill and germination		USA
16	Phaseolus evaluation		Netherlands
17	Clarification of fresh seeds		Switzerland
18	Lighting requirements		USA
19	Prewashing of <i>Beta vulgaris</i>		Switzerland
20	Testing less than 400 seeds and tolerance tables		United Arab Emirates
21	Detached endosperms		UK
22	Temperature controls		Switzerland
23	Differences between the rules and Handbook (<i>Helianthus</i>)		Germany
24	Extending germination period		Italy
25	Literature availability		Norway
26	Evaluation of seedlings at the final count		Norway
27	Using Top of Sand (TS) as a substrate		Switzerland
28	Loss of germination in storage		Switzerland
29	Pleated paper suppliers		Slovenia
30	First count criteria to apply in group A.1.2.3.3		Argentina
31	Substrate moisture and sand composition regarding <i>Phaseolus</i> germination methods		Netherlands
32	Evaluation of the coleoptile and first leaf in <i>Triticum</i>		Sweden
33	Germination rounding tool		Netherlands
34	Filter papers for germination		Finland
35	Germination testing of popcorn and sweetcorn		Zambia
36	ISTA Handbook on Seedling Evaluation - Asparagaceae		USA
37	Tolerance tables used in Table 13C		France
38	First counts in germination tests		India
39	Alternative germination methods		Turkey
40	Water retention checking of media		Republic of Korea
41	Water retention checking of media		Australia

 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	Tajinder Grewal	Canada	
4	Andrea Jonitz	Germany	
5	Jean-Louis Laffont	France	
6	Dwarkesh Parihar	India	
7	Elena Perri	Italy	
8	Kirk Remund	United States	
9	Ana Laura Vicario	Argentina	
10	Bruno Zaccomer	France	
11	Ray Shillito	United States	
12	Laura Bowden	UK	
13	Benoit Maes	Belgium	
14	Sophie Seoane	France	
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 finalisation	Progress report Date:
	<i>No Rules changes/development</i>	-	-
B. PUBLICATIONS			
<u>B1. Publications to accompany the Rules</u>			
	Publication title	Proposed finalisation	Progress report Date:
1	<i>GMO Testing Handbook (R. Mathis and E. Noli WG Leads) Further progress made in Chapter 6 and related documents. Collaboration with STA and VAR TCom and Accreditation and Quality Management Team at the Secretariat.</i>	2024	<i>Draft January 2024</i>
<u>B3. Scientific information publications</u>			

	Publication title	Proposed finalisation	Progress report Date:
C. WORKSHOPS AND SEMINARS			
<u>C1. Training and education workshops</u>			
	Workshop subject and location	Proposed finalisation	Progress report Date:
1	<i>Workshop: “GMO Testing: Statistical Aspects and Implementation of the Performance-Based Approach, hosted by CREA DC Seed Testing Laboratory in Tavazzano (Lodi, Italy) Collaboration with STA and CREA personnel.</i>	<i>Held June 1-3 2023</i>	--
<u>C2. Seminars and education workshops</u>			
	Seminar subject and location	Proposed finalisation	Progress report Date:
1	<i>ISTA Seminar: “From Biodiversity to Diversification: resources, tools and technologies to meet new challenges” – The afternoon session was devoted to the New Genomic Techniques, in particular on their creation, utilisation and testing of NGT plants, organised by GMO members (E. Perri and E. Noli)</i>	<i>Held May 29 2023</i>	--
D. Proficiency Tests -			
	Proficiency Test Subject	Proposed finalisation	Progress report Date:
1	<i>PT24 – Maize Collaboration with industry, TCom Coordinator and STA TCom</i>	2024	<i>Early stages January 2024</i>
E. Questions to the Committee - Since date of last report			
	Question subject	Date	From (Country)
1	<i>Clarification requested on the need to report the size of the working sample (i.e. number of seeds) when issuing an OIC with GMO testing results. Explanation provided, but need to improve clarity in Rules 19.7.</i>	11/01/2023	Japan
2	<i>Several exchanges with GMO-accredited laboratories regarding the interpretation of new standardised terminology in relation to their Scope of Accreditation.</i>	10/11/2023 23/11/2023 27/11/2023 30/11/2023	USA France Denmark Argentina
F. SPECIAL PROJECTS			
	project title / subject and collaborating committees	Proposed finalisation	Progress report Date:

	<p><i>The List of Standard Terms in GMO Testing was finalised reaching the desired harmonization.</i></p> <p><i>The new terminology has been adopted in the accreditation database at the Secretariat.</i></p> <p><i>A new Application form for (Re-)Accreditation for GMO testing of an ISTA Member laboratory has been developed allowing data exchange with accreditation database at the Secretariat.</i></p> <p><i>The display of the Scope of Accreditation of individual laboratories on ISTA website has been improved, allowing a more precise description of their competences for the benefit of ISTA stakeholders.</i></p> <p><i>Project realized with the collaboration of the Accreditation and Quality Management Team at the Secretariat.</i></p>	2023	Finalised 2023
2	<p><i>Revision of document “Performance Data Evaluation for the assessment of presence and estimation of level of seed with specified traits in seed lots”, almost complete.</i></p> <p><i>Collaboration with STA Com</i></p>	2024	Final draft, January 2024
3	<p><i>Revision of document “GMO PT seed check and sample preparation”.</i></p> <p><i>Collaboration with TCom Coordinator and STA Com</i></p>	2024	Revisions to be discussed

7. MOI Seed Moisture Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	Chair: Axel Goeritz	Germany	chair since 2020, member since 2015
2	Vice-Chair: Tanja Petrovic	Serbia	Vice chair since 2021, Member since 2019
3	Sergio Pasquini	Italy	Liasion officer since 2022; member since 2007
4	Gerarda de Boer-Raatgever	Netherlands	member since 2007
5	Susan Alvarez	United States of America	member since 2015
6	Baymolo Goma	Zambia	Member since 2015
7	Wen-Ju Yang	Separate Customs Territory of Taiwan	Member since 2015
8	Celine Herbert	France	Member since 2016
9	Selma Kurt	Turkey	Member since 2019
10	Ramesh D M	India	Member since 2020
11	Fiona Hay	Denmark	Member since 2020
12	Brady Carter	United States of America	Member since 2021
13	Daniela Villa	Italy	Member since 2022
14	Chandreschekara Bhat	India	Member since 2022
15	Ainara Fernandez	Ireland	Member since 2023

A. RULES DEVELOPMENT				
<u>A1. Introduction of New Methods</u>				
				remarks
Method name	proposed	collaboration		update
subject	finalisation			progress
1	Use of equilibrium Relative Humidity (eRH) as an alternative method for the determination of seed moisture status	2023	FTS, STA	The use of eRH for testing of coated seeds to be investigated. Experiments have been conducted to see whether determination of seed equilibrium relative humidity can be used for coated seeds, i.e. whether a coating changes the equilibrium moisture content-relative humidity relationship.
<u>A2. Introduction of New Species</u>				
				remarks
Species and test	proposed	collaboration		update
	finalisation			progress
1	<i>Moringa oleifera</i> oven method	2025		The first drafts of a test plan for a validation study has been created and is currently discussed.
<u>A3. Introduction of Rules Changes</u>				
				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> ,	2024	STA	This work has not yet conducted due to staffing issues but is planned to progress as soon as volunteers are available.
2	<i>Helianthus annuus</i>	2023	STA	Goal is to introduce the high temp. oven method for H. in the rules. The results of a comparison between two labs has been presented in Cairo 2022. The influence of TSW will be checked in more labs, a proposal for a comparative test is currently being prepared. This project is planned to progress as soon as volunteers are available.
3	Review 9.3 Determination of moisture content by moisture meters	2025	ISTA labs accredited to issue OIC and BIC with moisture meters	A project group has been formed and a questionnaire has been sent to all ISTA labs accredited for the use of moisture meters.
B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
				remarks

	Publication title	proposed finalisation	collaboration	update progress
1	Review and update Handbook on Moisture Determination	2025	Secretariat	Lead is named and chapters to work on are given to resp. members, planned changes on moisture calculator and calibration of moisture meters will influence the handbook as well
B3. Scientific information publications				
	Publication title	proposed finalisation	collaboration	remarks update progress
1	Extension of the Excel Moisture calculator on the homepage regarding routine tests and QM	2024		Project is in work
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
	workshop subject location	proposed finalisation	collaboration	remarks update progress
	Tetrazolium Testing and Equilibrium Relative Humidity (eRH) Determination for Native Species Peri, Italy	2023	TTG	" In 2 workshops of 2 days each one, the 40 participants got a very good insight in preparing and evaluating seeds applying TEZ test and the eRH method for 6 native species not included in ISTA Rules".
D. PROFICIENCY TESTS				
	Proficiency test subject location	proposed finalisation	collaboration	update progress
1				
E. QUESTIONS TO THE COMMITTEE				
	subject of question	Month		from country
1	Minimum sample size required for samples that need to be cut	Jul 2023	BSC	BSC
2	Will water activity replace in future the moisture content?	11-2023		ZA
remark: many questions have been answered on a bilateral basis and are not meant to be published				

- New project
- New proposed finalisation dae

8. NOM Nomenclature Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	CHAIR: Melanie Schori	United States of America	
2	VICE-CHAIR: Ernest Allen	United States of America	
3	Susan Alvarez	United States of America	
4	Michel Chauvet	France	
5	Axel Diederichsen	Canada	
6	Carol Elliott	New Zealand	New member
7	Marco Hoffman	Netherlands	
8	Deborah Meyer	United States	
9	Romina Rodriguez	Argentina	New member
10	Diogo Tobolski	France	New member
11	Sigyn Valgrind	Denmark	New member
12	John Wiersema	United States of America	
F. SPECIAL PROJECTS			
project title / subject			remarks
collaborating committees	proposed	collaboration	update
	finalisation		progress
Updates to ISTA Stabilised List for species added to Rules			There are 60 names that members have asked to have included in the next edition. NOM will be sending these names to other committees for their consideration in 2024.
Request from 2018 to add to GRIN names of native species grown as ornamentals			Finished adding names from list of more than 3000 taxa sent by Gil Waibel
E. QUESTIONS TO THE COMMITTEE			
subject of question	date		from country
1 Aligning name changes with OECD	January		Switzerland
2 Inclusion of <i>Thinopyrum</i> in <i>Elymus</i> in Table 9A	January		Germany
3 Request for fewer name changes	January		Serbia

4	Request for proposed changes document from 6 th edition of <i>Stabilised List</i>	March		United Kingdom
5	Request to add <i>Anthriscus caucalis</i> to the <i>Stabilised List</i>	August		Germany
6	Request for <i>Stabilised List</i> in Excel format	August		Denmark
7	Request for addition of UPOV codes to Excel file	August		Denmark
8	<i>Eucalyptus pulverulenta</i> authorship	September		Germany
9	Membership in <i>Festuca ovina</i> s.l. and <i>Festuca rubra</i> s.l.	September		France
10	Reporting species vs. subspecies	October		Italy
11	Placement of section in <i>Solanum</i> sect. <i>Lycopersicon</i>	October		Canada
12	Reporting a species identification when germination table lists Genus spp.	November		Switzerland
13	Correct name for <i>Ocimum citriodorum</i>	November		Moldova
14	EPPO codes	December		Netherlands
15	Placement of <i>Solanum torvum</i> in <i>Solanum</i> sect. <i>Lycopersicon</i>	December		Italy
16	Request for data from GRIN for seed testing protocol website	December		United States of America
17	Listing a taxon according to Rules or as stated by applicant	December		Moldova

New project

New proposed finalisation date

9. PUR Purity Committee

COMMITTEE MEMBERSHIP LIST (2023)			
	Members	Country	Member 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	Deborah Meyer	United States of America	1995
7	Dot Vittrup Pedersen	Denmark	2013
8	Sue Cousins	New-Zealand k	2017
9	Kepha Oganda	Kenya	2010
10	Maria Duter	New Zealand	2011
11	Selma Kurt	Turkey	2016
12	E. (Erik) van Egmond	Netherlands	2019
13	Sumaia Mahmuda	Bangladesh	2021
14	Tauhid Parvez	Canada	2022
15	Shankara Naika	Netherlands	2022
A. RULES DEVELOPMENT			
A1. Introduction of New Methods			
	Method name	Proposed/ finalisation	collaboration
			Remarks/ update/ progress
1	Working weight determinations for adding and revising Table 2C were introduced in 2023 in collaboration with BSC and STA. <i>Calculator for adding working weights to Table 2C of the ISTA Rules</i> was published on the ISTA website https://www.seedtest.org/en/services-header/tools/statistics-committee/calculator-adding-working-weights-table-2c-ista-rules.html		
2	Blower Calibration	Proposed	In progress
A2. Introduction of New Species			
	Species and test	Proposed/ finalisation	collaboration
			remarks /update /progress
	NA		
A3. Introduction of Rules Changes			
	Subject	Proposed /finalisation	collaboration
			Remarks/ update /progress
1	Chapter 3, Table 3B Part 3. Revised for the definition of "Seed Unit"	Proposed	proposed for 2024
2	Chapter 3, Table 3B Part 1. PSD 36	Proposed	proposed for 2024
3	Chapter 3, Table 3B Part 1. PSD 64	Proposed	proposed for 2024
4	C.3.2. and 3.7, 1.5.2.2. Revised for adding	Proposed	proposed for 2024

	special test requests by applicants			
B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
	Publication title	Proposed /finalisation	collaboration	Remarks/ update/ progress
1	PSD Handbook Revision	In the work plan		Draft was ready in 2023
<u>B2. Training publications on specific seed testing topics</u>				
	Publication title	Proposed/finalisation	Collaboration	Remarks/ update/ progress
1	Training materials for seed ID on the ISTA universal list	In progress		ISTA Secretariat made a proto type for the website publication in 2024
2	Publish an inventory of references of Seed ID	In progress		Draft format in ISTA webiste
3	Publish FAQ in ISTA website to the PUR committee	In progress		Drafted
5	Standardization on training materials used in ISTA purity workshop	In progress		Work plan for 2023-2026
<u>B3. Scientific information publications</u>				
	Publication title	Proposed /finalisation	Collaboration	Remarks/ update/ progress
1	Project Summary on ISTA Special Project 20-2	Published	ISMA, CFIA	Seed Testing International
2	Calculator for working sample weight	Published	STA	Seed Testing International
3	Seed ID Fact sheets	Published (partially)	ISMA/Authors	Seed Identification Guide®
4	Seed ID reference Inventory	Proposed	ISTA Secretariat	ISTA website
5	Purity Committee annual activities	Published		Seed Testing International
C. WORKSHOPS AND SEMINARS				
<u>C1. Training and education workshops</u>				
	workshop subject /location	Proposed /finalisation	Collaboration	Remarks/ update/ progress
1	Workshop to India	Delivered	GER	Delivered
2	PUR Open meeting and new technology panel discussion	Delivered	PT, STA, ATC	Make a wide update to ISTA members
3	Webinar on New Technologies in Seed Testing	Delivered	FAO-ISTA	Delivered on 4 October 2023

	presentation			
D. PROFICIENCY TESTS				
	Proficiency test	Proposed /finalisation	Collaboration	Remarks/ update/ progress
1	Seed Mixture Round 12	2023	PTC, accreditation department	Delivered by Dot Vittrup Pedersen for PT23-2
F. SPECIAL PROJECTS				
	Project title /subject	Proposed /finalisation	Collaboration	Remarks/ update/ progress
1.	Training materials for seed ID on the ISTA universal list	Approved project		Project started in July 2021 50% (70) species in the UL were completed
3.	Look into ways of training in seed identification and practical purity work	ongoing	ECOM/ISTA accreditation department	A seed ID webinar was planned for 2024

E. QUESTIONS TO THE COMMITTEE

	subject of question (see more details in PUR Teams)	date	country
1	PUR-#23-01 (half) Blower calibration sample	2023-01-24	UK
2	PUR-#23-02 PSD difference between ISTA and AOSA	2023-02-13	Germany
3	PUR #23-03: Purity Reporting 3.7	2023-03-08	Indonesia
4	PUR-#23-04 3.6.1.1 Test for weight gain or loss during analysis	2023-04-28	Ireland
5	PUR #23-05 Common name for inert	2023-04-30	Argentina
6	PUR #23-06 Reporting extra info for Limited Test	2023-05-11	ISTA Accreditation
7	PUR-#23-07 Seed Identification Inquiry	2023-06-12	Bangladesh
8	PUR #23-08 Coating materials %	2023-06-22	Uruguay
9	PUR #23-09 Other Seeds for sub-species	2023-07-23	Sweden
10	PUR #23-10 Report % in OSD test?	2023-02-13	New Zealand
11	PUR#23-11 Tolerance table-Table 4A	2023-09-25	Netherlands
12	PUR#23-12 PDS-Testing on Cotton	2023-09-11	UK
13	PUR#23-13 OIC name reporting, Table 2C?	2023-10-18	Japan
14	PUR#23-14 Chapter 11 -Encrusted seeds?	2023-11-14	ISTA Accreditation
15	PUR#23-15 Multiple Results Reporting-Chapter 4	2023-11-21	Netherlands
16	PUR#23-16 Seed Identification Inquiry	2023-11-27	Italy
17	PUR# 23-17 Seed Identification Inquiry	2023-11-28	India
18	PUR#23-18 Chapter 11-Coated seeds	2023-12-07	ISTA Accreditation

19	PUR#23-19 Insect Reporting	2023-12-07	ISTA Accreditation
20	PUR#23-20 ID accuracy	2023-12-07	ISTA Accreditation
21	PUR#23-21 Seed Counter Accuracy	2023-12-13	China
22	PUR#23-22 Applications of 3.5.4.1 indistinguishable species	2023-12-12	Italy
23	PUR#23-23 Reporting Chapter 3	2023-12-20	Republic of Moldova

10. SHC Seed Health Committee

COMMITTEE MEMBERSHIP LIST				
			change comments	
1	CHAIR: Ruud Barnhoorn	Netherland	Chair	
2	VICE-CHAIR: Stephan Brière	Canada	Vice chair	
3	VICE-CHAIR: Isabelle Serandat	France	Vice chair	
4	Ilaria Alberti	Italy		
5	Rouke Bakker	New Zealand		
6	Gary Munkvold	United States		
7	Dorota Szopinska	Poland		
8	Rosa Piña González	Chile	Since 2016	
9	Xiulan Xu	China	Since 2017	
10	Marian Mc Ewan	United Kingdom	Since 2019	
11	Kohei Osaki	Japan	Since 2019	
12	Dr. Mahesh B	India	Since 2021	
13	Luciana Ferrand	Argentina	Since 2022	
14	Sandra Nagamani	India	Since 2023	
15	Shih-Min Su	S.C.T. of Taiwan, Penghu, Kinmen and Matsu	Since 2023	
A. RULES DEVELOPMENT				
A1. Introduction of New Methods				
			remarks	
Method name	proposed	collaboration	update	
subject	finalisation		progress	
1	<i>Fusarium graminearum</i> , <i>F. langsethiae</i> , <i>F. culmorum</i> , <i>F. poae</i> ... – Cereals new method	2013-2023	Nibio Norway	All validation criteria are met and CT for the test is executed. Data analysis currently being processed. Report finished in 2024.
2	<i>Fusarium oxysporum</i> on tomato – new method	2013-2023	Naktuinbouw	Test plan accepted by ISTA, dilution plating, PCR for identification and pathogenicity test confirmation, analytical specificity, analytical sensitivity, selectivity and robustness performed. Diagnostic sensitivity and specificity data generated in 2023.

				CT planned 2024 validation to be done in 2024.
3	<i>Ascochyta rabiei</i> / chickpea	2013-2023	GEVES	Part of a research project at GEVES. CT organized and completed. Validation report reviewed and approved new rule proposed for the rule changes of 2024. Project finished
4	<i>Tilletia</i> species/wheat	2018-2023	GEVES	Validation of performance criteria on several modalities/options (shaking, filtration and centrifugation steps) Once the method is validated, give the laboratories the freedom to choose. Ring testplan expected in 2024
5	<i>Pseudomonas syringae</i> pv. <i>glycinea</i>	2018-2023	USDA	Test plan accepted by ISTA, dilution plating, multiple enzyme mediated characteristic screening and pathogenicity test confirmation, The original timeline due date for the validation report was 2023. The project is behind schedule due to several factors. The factors include soybean plant issues in the U.S. and the project lead at GEVES leaving. New projected completion date is the end of 2024
7	<i>Botrytis cinerea</i> on hemp seeds	2019-2023	CREA, GEVES	Test plan accepted by ISTA, All validation performance characteristics are conducted. CT planned for early 2024
A3. Introduction of Rules Changes				
				<u>remarks</u>
	Subject	Proposed finalisation	collaboration	Update progress
1	PCR detection of <i>L. maculans</i>	2019-2024	Canadian Food Inspection Agency	Test plan accepted by ISTA, All validation performance characteristics are conducted. CT planned for early 2024
2	Change of process flow Xcc (7-019a)	2023	Ruud Barnhoorn	Current process flow is that of ISF-ISHI and is not complete. New ISTA standard lay-out the method determined.
3	thorough Methods review	2023	All members of SHC	Methods to review shared among members to check for clarity
4	Making rules taxonomical just		Ruud Barnhoorn	Adding new taxonomic names of pathogens between brackets to the methods
5	Xhc 7-020 PCR not specific enough	2023	All members of SHC	Editorial modification submitted to rules proposals
B2. Training publications on specific seed testing topics				
				<u>remarks</u>
	Publication title	proposed	collaboration	update
1	Seed Health Handbook	2013-2022	Terry Aveling, SHC, ISTA editor	Handbook to be published in 2024
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
				<u>remarks</u>
	Workshop subject	proposed	collaboration	update
	location	finalisation		progress

1	Bangalore India, advanced QA workshop, QA in Seed health testing, and accreditation	AUG 2024	SHCOM	
C2. Seminars				
				<u>remarks</u>
	Seminar subject	proposed	collaboration	update
	location	finalisation		progress
	Webinar 'Chemical treatments to manage seedborne pathogens'	21 Apr 2023	ISPP, ISF, AIPP	Chair provided an introduction presentation on ISTA's Perspective on the webinar topic.
	Webinar on New Technologies in Seed Testing	4 OKT 2023	FAO	Chair presented the SH topic of the Webinar Advancement in technologies for Seed Health testing
	qPCR <i>Leptosphaeria maculans</i> + SH symposium	2024	Canadian Food Inspection Agency	Seed Health seminar and workshop, 2024 Ottawa, Canada
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
1	7-029, <i>Pseudomonas syringae</i> pv. <i>pisi</i>	2022-2023	Naktuinbouw	PT Performed and published on ISTA website
2	7-031, <i>Ditylenchus dipsaci</i>	2020-2021	GEVES	Performed
3	7-014, <i>Parastagonospora nodorum</i>	2019-2022	CREA	2023 Seeds to be used for the PT obtained, screening of usability to be done. Investigation on artificial infected seed usage to be started afterwards. PT to be conducted in 2024.
4	7-022, <i>Microdochium nivale</i>	2019-2022	SASA	PT Performed and published on ISTA website
5	7-006 <i>Colletotrichum lindemuthianum</i>	2019-2022	NARO	Planned 2024 looking for infected seed lots (seeds available from SGS Canada)
4	7-016 <i>Phomopsis</i> complex	2022-2023	GEVES	PT Performed and published on ISTA website
F. SPECIAL PROJECTS				
	Project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
	ISTA Reference Pest List:	2018-2024	GEVES	One additional crop (chickpea) added making the total crops published 24, two additional lentil and lupin under review by SHC to be published early 2024. Project including tree and millet seed under progress.

Insect detection/identification project	2021-2022	ATC, ANSES-LSV	Project finalized. Report and paper in STI published. Closing workshop organized in January 2024.
Pathogen image collection	2024-2025	SGS, whole SHC, ISTA secretariat	ISTA Special project granted: Develop an image collection linked to the pests of the ISTA Reference Pest List, with explanations on morphology

New project
New proposed finalisation date

11. Statistics Committee

COMMITTEE MEMBERSHIP LIST				
				change comments
1	CHAIR: Kirk Remund	United States of America		
2	VICE-CHAIR: Jean-Louis Laffont	France		
3	Gabriel Carré	France		
4	Mustapha El Yakhlifi	France		
5	Zhou Fang	United States of America		
6	Bonnie Hong	United States of America		
7	Oluseyi Odubote	United States of America		
8	Thomas Michelin	Brazil		
9	Bo-Jein Kuo	Separate Custom Territory of Taiwan, Penghu, Kinmen and Matsu		
10	Ray Shillito	United States of America		Ray resigned at the end of 2023
11	Kelly Evans	New Zealand		
12	Lara Carolina Figueroa	Argentina		
13	Nicholas Syring	United States of America		
A. RULES DEVELOPMENT				
A1. Introduction of New Methods/New Species				
				remarks
Method name	proposed	collaboration	update	
subject	finalisation		progress	
1	Beta vulgaris Method Validation Analysis	Complete	GERM	
2	Beta vulgaris Method Validation Review	Complete	GERM	
3	Ascochyta rabiei Method Validation Review	Complete	SHC	

4	Addition of Glycine max to radicle emergence test for seed vigour Review	Complete	VIG	
A3. Introduction of Rules Changes				
				remarks
	Subject	proposed	collaboration	update
	collaborating committees	finalisation		progress
1	High oven temperature tolerance for seed moisture	Complete	Moisture	Rule proposal passed in Verona
C. WORKSHOPS AND SEMINARS				
C2. Seminars				
				remarks
	Subject	proposed	collaboration	update
	location	finalisation		progress
1	ISTA Webinar on Minimum Seed Weight for New Species Purity	April	Purity Secretariat	
2	Presentation "Statistical modelling in ISTA" for "Mathematical Modelling in Seed Testing" seminar	June	ATC	
3	GMO Testing Workshop in Tavazzano, Italy	June	GMO	Successful workshop with ~25 participants
4	AOSA/SCST Workshop on Method Validation in Saskatoon, Canada	June	Purity AOSA/SCST	Successful workshop with ~30 participants
F. SPECIAL PROJECTS				
	project title / subject			Remarks
	collaborating committees	proposed	collaboration	Update
		finalisation		Progress
1	STI Article for minimum seed weight for purity	January	Purity	
2	STI Article for seed moisture limits	January	Moisture	
3	R package <i>ISTAGemMV</i> Rollout	September		Rebuilt the package for R 4.0 and rolled it out with Germination Committee
4	Seed Lot Heterogeneity Test Tool for Continuous Responses	October	PT BSC	This tool is for continuous responses like conductivity and moisture
E. QUESTIONS TO THE COMMITTEE & Reviews				
	subject of question		Date	From
1	Moisture Rules Change		February	PT Committee
2	Moisture Tolerances		March	Denmark
3	Germination Tolerances		March	France
4	ISTAGermMV program & LS Means		March	Argentina
5	SST Review of Wild Species TZ vs Germ Testing Paper		March	SST
6	Multispectral Imaging in seed testing		May	Denmark

7	Repeatability/Reproducibility interpretation	July	Chile
8	Lot heterogeneity for continuous responses	August	PT Committee
9	ISTA tolerances for TSW reps	August	Canada
10	ISTA Tool Macro Security Error	August	Seed Health
11	Vigour Test & Field Emergence	August	Rwanda
12	CV Use for TSW in Rules 10.5.2.2	August	Japan
13	Method validation	August	Argentina
14	Submitted & working sample weight	September	Bulk & Sampling Committee
15	LOD for GMO group testing	September	France
16	R&r question for GLMM model	September	France
17	Z-score quantiles for PT tests	September	Israel
18	ISTA Rules Table 4A on Purity	October	Netherlands
19	Tolerance Question	November	Iran

12. STO Storage Committee

COMMITTEE MEMBERSHIP LIST			
		Country	Active since
1	Chair: Jayanthi Nadarajan	New Zealand	2019
2	Vice-Chair: Steven Groot	Netherlands	2016
3	Andreas Börner	Germany	2010
4	Sershen Naidoo	RSA	2011
5	Christina Walters	United States of America	
6	Xiang-Yun Yang	China	2011
7	G V Jagadish	India	2019
8	Nelson Barbosa Machado-Neto	Brazil	2022
9	Umarani Sinniah	Malaysia	2022
10	Louise Colville	UK	2022
11	Elisa Monteze Bicalho	Brazil	2022
12	Irfan Afzal	Pakistan	2022
13	Vacant*		
14	Vacant*		
15	Vacant*		
	*Applications have been received for these vacant positions		
A. DEVELOPMENT OF NEW SCIENTIFIC KNOWLEDGE AND TECHNOLOGY			Target

A1. Development of new scientific knowledge on optimum storage of recalcitrant seeds innovation in seed storage

Comment as below

Proposed for completion by 2025 - Target achieved (completed in 2022, & 2023)

A2. Development of effective storage methods for short-lived intermediate, oily, primed seeds and exceptional species

Target achieved (completed in 2022 & 2023)

For both activities A1 and A2, the committee is carrying out various research activities in this area to increase the understandings in optimum storage conditions for short-lived and recalcitrant seeds. These are reflected in the publication list, presentations at seminars and knowledge transfer through workshops as listed below. One highlight would be the review on “Seed Longevity—The Evolution of Knowledge and a Conceptual Framework” published in the journal *Plants* early this year which was co-authored by the STO TCOM committee members. This review captures the evolution of knowledge in seed longevity over the past five decades in relation to seed ageing mechanisms, technology development, including tools to predict seed storage behaviour and non-invasive techniques for seed longevity assessment. It particularly highlights that seed longevity is a complex trait and varies greatly between species and even seed lots of the same species. Environmental factors that induce cytoplasmic solidification and affect glassy properties and therefore seed storability was also discussed. The review concluded that seed storage biology is a complex science covering seed physiology, biophysics, biochemistry and multi-omic technologies, and simultaneous knowledge advancement in these areas is necessary to improve seed storage efficacy for crops and wild species biodiversity conservation (Nadarajan, J.; Walters, C.; Pritchard, H.W.; Ballesteros, D.; Colville, L. Seed Longevity—The Evolution of Knowledge and a Conceptual Framework. *Plants* **2023**, *12*, 471. <https://doi.org/10.3390/plants12030471>.)

B. PUBLICATIONS			
<u>B1. Publications of the seed storage handbook</u>			
		Target	Collaboration
Handbook on Seed Storage			

<p>1. The writing of the Seed Storage Handbook is a major task being undertaken by the STO TCOM. After various discussions, finalisation was made on chapters and authors to contribute to these chapters. After a period of slow progress, the activities for writing the handbook have accelerated in 2023. For most chapters initial drafts have been prepared or are almost in that stage. The chapter outline and drafts are on STO TCOM Team SharePoint site. The committee is aiming to finalise the handbook by the end 2024.</p>	<p>Proposed for completion by 2024 - On target</p>	<p>Several external authors who are experts in different seed storage biology area are collaborating for this task.</p>
<p>B2. Scientific information publications</p>		
<p>Publication title Target: 20 scientific publications (book chapters and journal articles, including in SS&T) on seed storage.</p> <ol style="list-style-type: none"> 1. Prasad C. T., M., Kodde, J., Angenent, G.C., Hay, F.R., McNally, K.L. and Groot, S.P.C. (2023) Identification of the rice Rc gene as a main regulator of seed survival under dry storage conditions. <i>Plant, Cell & Environment</i>, 46, 1962-1980. https://doi.org/10.1111/pce.14581 2. Sripathy, K.V. and Groot, S.P.C. (2023) Seed development and maturation. <i>Seed Science and Technology. Biology, Production, Quality</i> (Eds. M. Dadlani, and D.K. Yadava), pp 17-38 Springer. https://doi.org/10.1007/978-981-19-5888-5_2 3. Ranganathan, U., and Groot, S.P.C. (2023) Seed longevity and deterioration. <i>Seed Science and Technology. Biology, Production, Quality</i> (Eds. M. Dadlani, and D.K. Yadava), pp 91-108 Springer. https://doi.org/10.1007/978-981-19-5888-5_5 4. Guvvala S: Determination of seed viability in wheat (<i>Triticum aestivum</i>) and barley (<i>Hordeum vulgare</i>) by delayed luminescence. (Master Thesis supervised by Andreas Börner) Stuttgart, Universität Hohenheim, Fakultät Agrarwissenschaften, Institut für Kulturpflanzenwissenschaften (2023) 70 pp. 5. Lohwasser U, Börner A (Eds.): Physical, biochemical and molecular methods for determining seed quality: Book of abstracts of the Meeting of the Working Group Seed Science and Certification (GPZ/GPW) and Section IV Seeds (VDLUFA), Nossen, Germany, 7-9 March 2023. 6. Rehman Arif M A, Tripodi P, Waheed M Q, Afzal I, Pistrick S, Schütze G, Börner A: Genetic analyses of seed longevity in Capsicum annum L. in cold storage conditions. <i>Plants</i> 12 (2023) 1321. https://dx.doi.org/10.3390/plants12061321 7. Nadarajan, J.; Walters, C.; Pritchard, H.W.; Ballesteros, D.; Colville, L. Seed Longevity—The Evolution of Knowledge and a Conceptual Framework. <i>Plants</i> 2023, 12, 471. https://doi.org/10.3390/plants12030471. 8. Nadarajan, J.; Esfandiari, A.; Mathew, L.; Divinagracia, J.; Wiedow, C.; Morgan, E. Development, Management and Utilization of a Kiwifruit 	<p>Target</p> <p>Proposed for completion by 2023 - Target exceeded</p>	<p>Collaboration</p> <p>Various external collaborators</p>

- (*Actinidia* spp.) In Vitro Collection: A New Zealand Perspective. Plants 2023, 12, 2009. <https://doi.org/10.3390/plants12102009>
9. Van der Walt, K.; **Nadarajan, J.** Seed Storage Physiology of *Lophomyrtus* and *Neomyrtus*, Two Threatened Myrtaceae Genera Endemic to New Zealand. Plants 2023, 12, 1067. <https://doi.org/10.3390/plants12051067>
 10. Jean Carlos Bettoni, Karin van der Walt, Juliana Aparecida Souza, Andrew McLachlan & **Jayanthi Nadarajan** (2023): Sexual and asexual propagation of *Syzygium maire*, a critically endangered Myrtaceae species of New Zealand, New Zealand Journal of Botany, DOI: 10.1080/0028825X.2022.2158110.
 11. Surya Diantina, Craig McGill, Andrea Clavijo McCormick, James Millner, Hugh W. Pritchard and **Jayanthi Nadarajan**. Comparative seed cryopreservation of Indonesian and New Zealand epiphytic and terrestrial orchids. CryoLetters 44(4), 197-207 (2023). <https://doi.org/10.54680/fr23410110312>.
 12. Alfaro Pinto, Alejandra, Craig McGill, Jayanthi Nadarajan, Fredy Achila Morales, and Andrea Clavijo McCormick. 2023. "Seed morphology of three Neotropical orchid species of the *Lycaste* genus". Seeds 2, 331-339. <https://doi.org/10.3390/seeds2030025>.
 13. Kai, Y.; Alfaro Pinto, A., Clavijo McCormick, A., **Nadarajan, J.**, He, X.Z., MacKay, M., McGill, C. Seed Desiccation Sensitivity Varies with Geographic Distribution in Two New Zealand Native *Pittosporum* Species. *Seeds* **2023**, 2, 370-381. <https://doi.org/10.3390/seeds2030028>.
 14. van der Walt K, **Nadarajan J**, Mathew L, Bettoni JC and Souza JA (2023) Advances in cryopreservation of *Syzygium maire* (swamp maire, maire tawake) zygotic embryos, a critically endangered tree species endemic to New Zealand. *Front. Conserv. Sci.* 4:1269881. doi: 10.3389/fcosc.2023.1269881
 15. **Jayanthi Nadarajan**. Unlocking the secrets of seed dormancy. *Plant Production Science, New Zealand Plant Producers*. ISSN 2744-7367. Issue 4. November 2023.
 16. **Jayanthi Nadarajan**. Newsletter articles for New Zealand Biological Heritage: [New paper: Effective strategies for maire tawake propagation - Biological Heritage NZ \(bioheritage.nz\)](#)
 17. **Jayanthi Nadarajan**. Newsletter articles for New Zealand Biological Heritage: [New paper outlines the challenges of preserving maire tawake seeds - Biological Heritage NZ \(bioheritage.nz\)](#)

18. **Jayanthi Nadarajan**. Assessing seed excellence: Viability, germination, and vigour. Plant Production Science, New Zealand Plant Producers. ISSN 2744-7367. Issue 4. November 2023.
19. Daniela Goeten, Rosa Angélica Elias, Luiza Giacomolli Polesi, **Christina Walters**, Miguel P Guerra, Neusa Steiner (2023). Effect of water content and biochemical cell state on the germination rate of cryopreserved *Butia eriospatha* embryos (Arecaceae). Plant Cell, Tissue and Organ Culture, 152: 339-356.
20. Hannah Tetreault, Margaret Fleming, Lisa Hill, Emma Dorr, Kathleen Yeater, Christopher Richards, **Christina Walters** (2023). A power analysis for detecting aging of dry-stored soybean seeds: Germination versus RNA integrity assessments. Crop Science 63: 1481 -1493.
21. Daniela Goeten, Francine L Farias-Soares, Gladys D Rogge-Renner, Maria LT Pereira, **Christina Walters**, Vanildo Silveira, Claudete S Catarina, Miguel P Guerra, Neusa Steiner. (2023). Carbohydrate and dehydrin-like protein profiles during *Araucaria angustifolia* seed development provides insights toward ex situ conservation. Trees. 1-15.
22. **Walters, C.**, Hill, L. M., & Tetreault, H. (2023) Seed Preservation and Genebanking: Challenges Forthcoming [Abstract]. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO.
<https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/148527>.

C. SEMINARS		Target	Collaboration
1	ISTA Annual Meeting, Verona, Italy 29 May -1 June 2023. STO TCOM was represented by Jayanthi Nadarajan supported by the technical committee annual fund. Jayanthi gave a presentation on the STO TCOM activity updates covering membership, seed storage handbook writing, ISTA special project, publications, conferences, and workshops. This was followed by a detailed talk on 'Cryopreservation of <i>Syzygium maire</i> ' as a case study on potential problems can be accounted for when working with a challenging recalcitrant system. The lessons learned from this study could be transferred onto other difficult to store species.	Proposed for completion by 2023 - Target achieved on May 2023	
2	Committee members presentation as various seminars on seed storage: <ol style="list-style-type: none"> 1. Groot S.P.C. Seed drying and storage. Invited lecture at MSc course Seed Science and Technology, 19 January 2023, Wageningen University, The Netherlands. 2. Groot S.P.C. The growing importance of seed vigour for crop establishment. Webinar to celebrate 50 years of Seed Science and Technology. 23 January 2023, Tamil Nadu Agricultural University, India. 	Proposed for completion by 2023 - Target achieved	

3. **Groot S.P.C.** Rice seed storage. Knowledge transfer visit Thai Rice Department to Wageningen University, The Netherlands, 22 June 2023.
4. **Groot S.P.C.** Seed drying. Perspectives from seed vigour. Workshop at Seed Meets Technology Fair, 26 September 2023, Zwaagdijk, The Netherlands.
5. **Groot S.P.C.** Emerging trends in processing and storage research. 12th National Seed Congress-2023 from the Indian Society of Seed Technology, 12 December 2023, Aurangabad, India.
6. **Groot S.P.C.** Emerging trends in seed storage research. Department of Seed Science and Technology, 14 December 2023. ICAR-Indian Agricultural Research Institute, New Delhi, India.
7. **Groot S.P.C.** Advanced techniques for seed drying and storage. Webinar for International Training Programme on “Advanced Post-Harvest Technologies for Seed Quality Improvement”, 19 December 2023. Indo-German Bilateral Cooperation on Seed Sector Development.
8. **Louise Colville**, Tim Marks, Anaité López-Alquijay, Wolfgang Stuppy, **Jayanthi Nadarajan**, Hugh W. Pritchard, Alexandre Monro. 2023. Exceptional desiccation resistance in recalcitrant seeds of the widespread, tropical tree, *Brosimum alicastrum*. Oral presentation at the 14th ISSS biennial Conference, 3-7 July 2023, Sorbonne University, Paris.
9. Diantina S, **Nadarajan J**, McGill C, Clavijo McCormick A, Millner J and Pritchard HW. 2023. A comparative cryopreservation study of Indonesian and New Zealand epiphytic and terrestrial orchid seeds. Oral presentation given at the Plant Science Central Conference, 4-6 July 2023. Palmerston North, New Zealand.

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D. WORKSHOPS		Target	Collaboration
1	A workshop on seed storage in Brazil in conjunction with the seed storage symposium Discussions are underway on planning and organisation of this symposium. The possibilities for financial support from government agencies also will be explored.	Proposed for completion by 2025 - On target	
2	Regional Seed Storage Workshop in Pakistan The organisation this workshop has been delayed due various reasons including severe flooding in Pakistan which needed much urgent attention.	Proposed for completion by 2024/2025 – On target	
3	The 18th Scientific Seed Symposium, 7-9 March 2023, Nossen, Germany	Proposed for	

The 18th Scientific Seed Symposium of the Working Group Seed Science and Certification of the German Society of Plant Breeding and the German Society of Plant Cultivation Research took place from March 7 to 9, 2023 in Nossen, Germany. A total of 111 participants from 7 countries discussed the topic: "Physical, Biochemical and Molecular Methods for Determining Seed Quality". The conference was opened by Gerhard Leubner, Professor at Royal Holloway University of London, Great Britain. Prof. Leubner is an internationally recognized seed researcher. In his overview presentation on the topic: 'Crop seed quality and innovative seed technologies for sustainable food production and seed bank storage', he pointed out that improved seed quality, achieved through breeding and innovative seed improvement technologies, is the cornerstone for the maximum yield potential of our crops. This was followed by 14 further specialist lectures on new methods for determining seed quality. The objects examined included wheat, barley, rye, pea, rapeseed and sugar beet. After the lecture program, a workshop on seed diagnostic characteristics in cereals took place. It is planned to hold the next meeting of the Working Group from March 11 to 13, 2025 in Gatersleben, Germany.

completion
by 2023 -
Target
achieved



E. SPECIAL PROJECTS

Project title / subject

Use of equilibrium relative humidity measurements for determining the moisture status of stored seeds [Led by Fiona Hay (Moisture Committee) and Jayanthi Nadarajan (Storage Committee)].

- The project activities are still ongoing.

2 Storage optimization of primed seeds (Proposed by Sershen and Elisa)

Target Collaboration

Proposed for completion by 2023 - Project will be extended beyond 2023

ISTA Seed Moisture Committee

Proposed for

<ul style="list-style-type: none"> This project proposal was submitted to the ISTA evaluation committee for the special projects. However, this application was not successful. The advice from the ECOM was to tailor the project to ISTA activities i.e., method development. The committee decided to withdraw this application. 	<p>completion by 2025 - Target partially achieved for proposal submission.</p>
<p>Development of effective storage methods for short-lived primed seeds in certain vegetable crops (proposed by Jagadish and Steven)</p> <p>3</p> <ul style="list-style-type: none"> This project is being delayed due to difficulties in establishing collaborative partners and Steven's retirement. Other options are being considered currently. Not targetted for submission in January 2023. 	<p>Proposed for completion by 2025 – On target</p>

13. TEZ Tetrazolium Committee

TEZ Tetrazolium Committee			
COMMITTEE MEMBERSHIP LIST			
1	Chair: Sergio Pasquini		Italy
2	Vice-Chair: Steffi Krämer		Germany
3	Ignacio Aranciaga		Argentina
4	Maria Belen Aranguren		Argentina
5	Alessandra Arioli		Italy
6	Jose de Barros Franca-Neto		Brazil
7	Sunita BH		India
8	Valerie Blouin		France
9	Augusto Martinelli		Argentina
10	Shaminder Miranpuri		United States of America
11	Tauhid Parvez		Canada
12	Asia Roberts-Yalland		United Kingdom
13	Veena Gouda		India
14	Edith Daboue		Burkina Faso
15	Eoin O'Connor		Ireland

A. RULES DEVELOPMENT			
<u>A2. Introduction of New Species</u>			
	Species and test	proposed	collaboration
		finalisation	
1	<i>Ulmus</i> spp. tetrazolium test	Jun 2023	
2	<i>Glycine max</i> L. tetrazolium test	Jun 2024	
<u>A3. Introduction of Rules Changes</u>			
1	Paragraph 6.6 was modified		
2	Consequential changes if C.5.1 is accepted of paragraphs: 6.5.2.1.2, 6.5.4 and 6.7		
B. PUBLICATIONS			
<u>B1. Publications to accompany the Rules</u>			
1	ISTA Peer Method Validation for Tetrazolium test in Elms (<i>Ulmus</i> spp.)	STI nr.165	
2	Short videos on TEZ methods	Dec 2024	ISTA Secretariat
<u>B2. Training publications on specific seed testing topics</u>			
	Publication title	proposed	collaboration
		finalisation	
1	New Tetrazolium Handbook	in progress, 2024	
2	TEZ working sheets	to be published online, 2024	
3	New TEZ Working sheets	in progress	
4	<i>Moringa oleifera</i> Lam. defined method to test viability	Jan 2023	
C. WORKSHOPS AND SEMINARS			
<u>C1. Training and education workshops</u>			
	workshop subject	proposed	collaboration
	location	finalisation	
1	ISTA TEZ MOI WS on wild species in Peri (VR) ITALY ,24-25 May 2023	done, May 2023	MOI
2	ISTA TEZ MOI WS on wild species in Peri (VR) ITALY ,26-27 May 2023	done, May 2023	MOI
<u>C2. Seminars</u>			

	Seminar subject	proposed	collaboration
	location	finalisation	
D. PROFICIENCY TESTS			
	Proficiency test subject	proposed	collaboration
	location	finalisation	
1	PT 22-3 <i>Lolium perenne</i> L.	done, Jan 2023	PTC, Accreditation Department
2	PT on viability <i>Glycine max</i> L.	Samples ready to dispatch Dec 2023	
E. QUESTIONS TO THE COMMITTEE			
1	TEZ on <i>Brassica oleracea</i> L. as vigour test	Feb 2023	from South Africa
2	Questions on par. 6.6 about tolerances	Mar 2023	From South Africa
3	Question about how to report in OIC species not included in the Chapter 6 of the Rules		from ISTA Accreditation Department
F. SPECIAL PROJECTS			
<u>Leaders of the working groups</u>			
	<i>Glycine max</i> L. method validation		Ignacio Aranciaga (AR)
	<i>Moringa oleifera</i> Lam. method validation		Steffi Kraemer (D)
	New TEZ Handbook		Jose Franca Neto (BR)
<u>contact persons</u>			
	ECOM Liaison Officer		Sergio Pasquini (I)

14. VAR Variety Committee

COMMITTEE MEMBERSHIP LIST			
			change comments
1	Chair: Ana Laura Vicario	Argentina	Member since 2007
2	Vice-Chair: Marie-Claude Gagnon	Canada	Member since 2020
3	Anne Bernole	France	Member since 2016
4	Berta Killermann	Germany	Member since 2004
5	Chiara Delogu	Italy	Member since 2007

	Hedwich Teunissen	Netherlands	Member since 2007 (moved to a new job position during 2023 and left the committee)
6	Kae-Kang Hwu	Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu	Member since 2007
7	Ksenija Markovic	Serbia	Member since 2013
8	Ksenija Taski-Ajdukovic	Serbia	Member since 2010
9	Keshavulu Kunusoth	India	Member since 2010
10	Ana Patricia Fernandez Getino	Spain	Member since 2021
11	Mariana Menoni	Uruguay	Member since 2021
12	Sean Walkowiak	Canada	Member since 2022
13	Umashankar Bellan	India	Member since 2023
14	Stephanie Guillet	France	Member since 2023
15	Lorella Andreani	Italy	Member since 2023

A. RULES DEVELOPMENT

A1. Introduction of New Methods

				remarks
	Method name	proposed	collaboration	update
	subject	finalisation		progress
1	DNA-based methods for barley	2024	SEC, STA,	Leader: Doris Kaiser from Austria. Validations documents are under review. A draft for the rules proposal is already prepared.
2	Validation of newly developed <i>Lolium</i> markers for determination of annual types in perennial ryegrass varieties.	2023	SEC, USDA, AOSA, STA	Leaders: Giovanni Lopez from the Netherlands (ISTA) and as co-lead Dan Curry from the USA (AOSA). Sequencing of both annual and perennial varieties is completed. Identification and selection of markers are completed. Reagents and seed samples were distributed to 4 participating laboratories for testing 4 markers. Markers were tested by the 4 participating laboratories but the design of new markers was necessary to improve the limit of detection. Three new markers have been designed and the 4 participating laboratories should began the testing soon.

A2. Introduction of New Species

				Remarks
	Species and test	proposed	collaboration	update
		finalisation		progress

A3. Introduction of Rules Changes

				remarks
	Subject	proposed	collaboration	update
		finalisation		progress

B. PUBLICATIONS				
<u>B1. Publications to accompany the Rules</u>				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	Handbook – DNA-based methods	2025	SEC, STA, GMO, Editorial	8 members of the committee started working on the Handbook during 2023. Two meetings were held and some progress were made.
<u>B3. Scientific information publications</u>				
				remarks
	Publication title	proposed	collaboration	update
		finalisation		progress
1	VARCOM progress report 2023 was published on STI	2023	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.	2024	SEC	Leader: Keshavulu Kunusoth, India. Organization started. Planned for June, 2019 but postponed due to insufficient registration. Now rescheduled to 2024. The workshop will be held jointly with the STATCOM and the GMO COM.
<u>C2. Seminars</u>				
				Remarks
	Seminar subject	proposed	collaboration	Update
	location	finalisation		Progress
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	Update
	location	finalisation		Progress
1	DNA-based methods (SSR) - wheat	2023	STA, SEC, Accreditation Department	PT"1" is finalized. Final results were reported in August 2023. Samples for wheat PT are kept, prepared and shipped by Canadian Grain Commission.
2	DNA-based methods (SSR) - maize	2025	STA, SSEC, Accreditation Department	We are working on getting public maize lines and hybrids seed samples for preparing a PT in 2025.
E. SPECIAL PROJECTS				
	project title / subject			Remarks

collaborating committees	proposed finalisation	collaboration	Update Progress
Artificial Intelligence for variety identification	2024	ATC, STA, SEC	<p>A proposal will be presented before January 20th 2023 for evaluation of the performance of a neuronal network system for variety identification. All previous discussions were carried out. A preliminary data set will soon be available for STACOM for making a decision on how to evaluate the method performance.</p> <p>The data set was sent to STACOM and reviewed. STACOM requested to run samples again in order to produce a second dataset. This will be carried out in Argentina by a member of ATC using the same samples used for the first test. Data will be sent to STACOM for analysis.</p>

F. QUESTIONS TO THE COMMITTEE

subject of question	from country
None	

G: Further Comments - Responsibilities

leader of working groups

1	PT leader for DNA-based tests	Ana Vicario (AR)
2	CT leader for AI variety identification assay	Ana Vicario (AR)
3	CT leader for barley	Doris Kaiser (AT)
4	Handbook leader	Marie-Claude Gagnon (CA)
5	Lolium WG leader	Giovanni López (NL)

contact persons

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)

- New project
- New proposed finalisation date


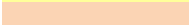
15. VIG Seed Vigour Committee

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	Jaana Kaurila	Finland	New member March 2023
10	Tim Loeffler	United States of America	
11	Stan Matthews	United Kingdom	
12	Carey Matthiessen	Canada	
13	Gillian Musgrove	United Kingdom	
14	Takashi Shinohara	Japan	
15	Marie-Hélène Wagner	France	
A. RULES DEVELOPMENT			
A1. Introduction of New Methods			
	Method name subject	proposed finalisation	collaboration
			remarks update progress
1	Cold test for <i>Zea mays</i>	2025	Test plan prepared for an international comparative test. Seed material provided by two seed companies. Comparative tests done with 7 French labs in 2023
A2. Introduction of New Species			
	Species and test	proposed finalisation	collaboration
			remarks update progress
1	Radicle emergence test: <i>Allium cepa</i>	2024	Comparative test completed by labs in India and Europe. Data being analysed
2	Radicle emergence test: <i>Glycine max</i>	2023	Comparative test completed, validation report accepted .
3	Radicle emergence and conductivity tests as potential vigour tests for five vegetable Brassic species. (ISTA special project)	2024	Germination committee Validation report for radicle emergence to be submitted
4	Radicle emergence test for spinach (<i>Spinacia oleracea</i>)	2024	Practical work completed
5	Radicle emergence test for sweet corn (<i>Zea mays</i> convar. <i>saccharata</i>)	2024	Work continues
6	Radicle emergence test for dill (<i>Anethum graveolens</i>)	2024	Laboratory and field tests completed. Further work in progress.

7	Field emergence in barley: comparisons to relate to radicle emergence test	2024		Further work continues following positive results
8	Radicle emergence test for <i>Oryza sativa</i>	2025		Work continues
9	Radicle emergence test for <i>Sorghum bicolor</i>	2025		Work continues
10	Radicle emergence test for pearl millet	2025		Work continues
11	Radicle emergence (RE), AA, AA+RE tests in red beet ng emergence and storage longevity.	2025		Work continues
12	Controlled deterioration test for tomato seeds	2025		Trials completed with 5 seed lots comparing two temperatures and three moisture contents. Data analysis in progress
A3. Introduction of Rules Changes				
	Subject	proposed finalisation	collaboration	remarks update progress
1	Introduction of the RE test for soybean	2024		Rules proposal submitted for consideration in 2024
2	Clarification of the interpretation of results of the RE test carried out at different temperatures	2024		Rules proposal submitted for consideration in 2024
B. PUBLICATIONS				
B3. Scientific information publications				
	Publication title	proposed finalisation	collaboration	remarks update progress
1	Variety affects radicle emergence test results in wheat	2023	Pauliina A.M. Summanen and Jaana Laurila	<i>Seed Science and Technology</i> , 51 , 221-227
2	Radicle emergence test for soybean vigour testing	2023	Carina Gallo and Luciana Magnano	<i>Seed Science and Technology</i> , 51 , 3, 493-503
3	Radicle emergence as seed vigour test estimates seedling quality of hybrid cucumber (<i>Cucumis sativus</i> L.) cultivars in low temperature and salt stress conditions.	2023	Ibrahim Demir, Canan Oztokat Kuzucu, Sitki Ermis and Güleda Öktem	<i>G. Horticulturae</i> , 9 , 3. Online journal; https://doi.org/10.3390/horticulturae9010003
4	Seed longevity potential predicted by radicle emergence (RE) vigor test in watermelon seed cultivars	2023	Erkan Eren, Sitki Ermis, Güleda Öktem and. Ibrahim Demir	<i>Horticulturae</i> 9 , 280. https://doi.org/10.3390/horticulturae9020280
5	Radicle emergence test can be assessed using multispectral imaging for <i>Brassica oleracea</i>	2023	Marie-Hélène Wagner, Audrey Dupont, Stan Matthews, Alison Powell, Takashi Shinohara, Sylvie Ducournau	<i>Seed Science and Technology</i> , 51 , 291-296.

6	The influence of seed moisture content on the results of the Radicle Emergence test of rapeseed (<i>Brassica napus</i>)	2023	Sebastian Bopper, Simon Goertz, J. Zur and Michael Kruse	Public meeting "Seeds" 134th VDLUFA Congress Abstracts, page 111
7	A study on the development of new seed vigour tests for brassica vegetables II: Flow cytometry as a technique for determination of seed aging and prediction of field emergence in mustard	2023	Yuka Masuda, Saki Yoshid and Takashi Shinohara	<i>Research for Tropical Agriculture</i> , 16(Extra issue 2) , 35-36.
C. WORKSHOPS AND SEMINARS				
C1. Training and education workshops				
	workshop subject	proposed	collaboration	remarks
	location	finalisation		update
				progress
1	Workshop on Vigour for postgraduates in Seed Technology. National University of Córdoba, Argentina.	November 2023		Presented by Carina Gallo
2	Workshop on Vigour for postgraduates in Seed Production National University of Rosario, Argentina	April 2023		Presented by Carina Gallo
3	APSA Seed Technology Webinar: Using Vigour Test Results for Management of Seed Inventory	October 2023		Presented by Tim Loeffler
4	APSA Seed Technology Webinar: Towards seed vigour tests for the ISTA Rules: Principles and standardization	October 2023		Presented by Alison Powell
5	Tamil Nadu Agricultural University, webinar as part of the celebrations of their 50 th anniversary: From seed physiology to seed vigour	March, 2023		Presented by Alison Powell
6	APSA/ISTA Seed vigour workshop, Kasetsart University, Bangkok Thailand	September 26-28		Alison Powell, Hulya Ilbi, Stan Matthews, Marie-Hélène Wagner
D. PROFICIENCY TESTS				
	Proficiency test subject	proposed	collaboration	update
	location	finalisation		progress
	EC test for radish	2024	PT, STA	Data being reviewed prior to report
F. SPECIAL PROJECTS				
	project title / subject			remarks
	collaborating committees	proposed	collaboration	update
		finalisation		progress
1	Organic seed production of chickpeas (Kabuli type)		M. Khajeh Hosseini, F. Fallahpour, M. Amini	Work continues
2	Organic seed production of pepper	2023	M. Khajeh Hosseini, F. Fallahpour, M. Cheshmi, Z. Yazdi	Work completed, and a manuscript provided to submit.
E. QUESTIONS TO THE COMMITTEE				
	subject of question			from
				country
1	Problem of hard seed in <i>Phaseolus vulgaris</i>	March		Japan

2	Is there a vigour test for sorghum?	June		UK
3	Use of radicle emergence test for cotton	June		USA
4	Clarification of the criterion of 2mm radicle emergence in Raphanus sativus	July		Thailand
5	Potential use of containers that differ in the specified size for conductivity test	September		Philippines
6	Radicle emergence vigour test for melon: possible temperatures and timing of RE count	November		South Africa

 New project
 New proposed finalisation date