

Seed Health Committee update 2023-2024



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01-04 JULY CAMBRIDGE, UNITED KINGDOM

r.barnhoorn@naktuinbouw.nl



Members

Vice chairs elected:





Applications:

ISTA 100 years

- Eduardo Gálvez Sotelo (Chili)
- Jaiana Malabra (France)
- Shaista Karim (USA)
- Leticia Ruiz (Spain)
- Angela Thüringer (Austria)



. . .

	SHCom Members	Country	Active since
1	Ilaria Alberti	Italy	
2	Rouke Bakker	New Zealand	
3	Gary Munkvold	United States	
4	Dorota Szopinska	Poland	
5	Rosa Piña González	Chile	2016
6	Xiulan Xu	China	2017
7	Vice Chair: Stephan Brière	Canada	2018
8	Vice Chair: Isabelle Serandat	France	2019
9	Marian Mc Ewan	United Kingdom	2019
10	Kohei Osaki	Japan	2019
11	Chair: Ruud Barnhoorn	Netherland	2019
12	Dr Mahesh	India	2021
13	Luciana Ferrand	Argentina	2022
14	Dr. Nagamani Sandra	India	2023
15	Shih-Min Su	Taiwan	2023



Rules changes



Taxonomical update:

• Establish rules for taxonomical name changes.

Example

Current Rule	Rule change directly	Rule change in 3 years	Rule change in 6 years
Xanthomonas axonopodis pv. phaseoli	Xanthomonas axonopodis pv. phaseoli (Xanthomonas phaseoli pv. phaseoli)	Xanthomonas phaseoli pv. phaseoli (Xanthomonas axonopodis pv. phaseoli)	Xanthomonas phaseoli pv. phaseoli

• 2 rules updated with new taxonomical names.

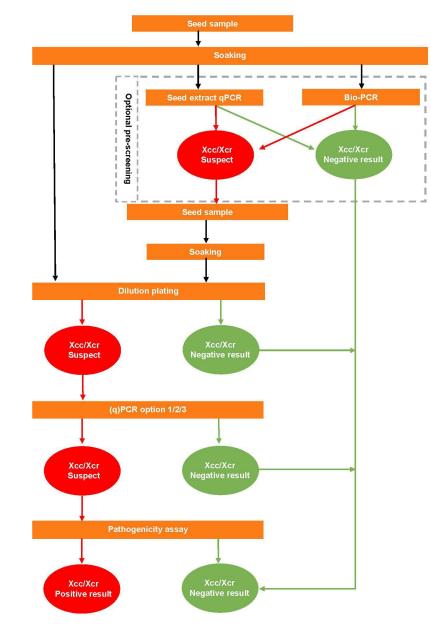




Rules changes

Technical rules changes (via external input)

- ISTA SHCOM own workflow lay-out
 - Introducing in all methods this year
- Adaptation of Rule 7-020 (*Xanthomonas hortorum* pv. *carotea*) due to new scientific knowledge
 - New strain types identified that make the confirmation PCR not specific enough anymore. Rule change submitted
- New: from the Audit Com. Replacing of reference to specific kits
 - The test kit prescribed in Rule 7-07-015 (*Epichloe coenophiala*) not available anymore.
 - All rules will be checked and changed in respect to reference to specific kits.







Method development and validation

Projects under progress:

- Fusarium (11 species)/cereals, NIBIO and Kimen Seed Lab:
 - Method: media grow-out -> suspect analysis via morphological identification
 - Comparative test executed and data analysis currently in progress.
 - New rule suggestion presented before 1 November
- *Fusarium oxysporum* f.sp. *lycopersici* in tomato, Naktuinbouw:
 - Method: media grow-out -> suspect qPCR -> pathogenicity assay
 - Comparative test executed and data analysis currently in progress.
 - New rule suggestion presented before 1 November
- Gray mold on hemp (*Botrytis cinerea*), CREA:
 - Method: Seed blotter -> suspect analysis via morphological identification
 - Comparative test executed and data analysis currently in progress.
 - New rule suggestion presented before 1 November













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Method development and validation

Projects under progress:

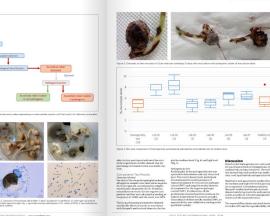
- Pseudomonas syringae pv. glycinea/soybean, NHSS
 - Method: Dilution plating, fluorescens screening, pathogenicity assay



- ISTA Rule 7-004 Leptosphaeria maculans and Plenodomus biglobosus in Brassica spp. Seed updated
 - Introduction of direct molecular testing via seed extract PCR to the protocol
 - Validation criteria all met.
 - Organisation of CT currently in progress

Rule 7-033 Ascochyta rabiei on chick pea seed

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<text><text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text></text>	WAS TO INTRODUCE A VALIDATED METHOD FOR THE DETECTION OF ASCOCYPTA RARBUN IN CALER ARETINUM (CHICKPEA) SEED into Chapter 7 of the International State for Send Worker (ISTA Rades. The validation of the	treatment with effective fungicides network the probability of nanomizing need-barne disease to the sendings (Gan et al., 2006). The indected seeds are often symptomiest, therefore, a reliable seed health detection methods certails to every fact infection and	fail of the times, weed blackened (most of the times, loaf volting (other), plantist routing bometimes). Method Validation Avaletical metVictly is the ability to detect	Ascochyta robiel not	
<text><text><section-header><text><text><text><text><text></text></text></text></text></text></section-header></text></text>	relations etheria described in the discusses; relation etheria described in the discusses of CDs, version 2. The also of this validation was in particular a detection method and a pathogenicity rule of A. Ander Tyry, Thoma militiv, also known by in ideorney fu name Dilyssafar rules (yrs, Mycephawilia rules), rupponible for Ascripti blight or chickpen plans. The partnermance of rules in far both	of other infected used or from movement of infected plant debris, via vindicerne sports discopared, malchinery or admits, spores of the fangues can survive for a short time on islin, dorbing and stachinery, Subsequent incomp infection occurs when the inneulant is moved hidrer in the cancers or to surrounding	and other organisms or samples which do not contain the target. Fur both the detection method and the pathogeneticity test, 40 instants (Distanger and 20 non-target includers) were relevent. On both the PDA and MA media, as well is in the gradbagmeticity trust, analytical specificity have done colony morphology and specific plants remetors was validated and	Mandatory step Negative results - Positive results - Optional step -	
<text><text><text><text></text></text></text></text>	test were determined, and a comparative test with six experienced laboratories was organized. The validation data was brought together is a validation or report. This report was	weather (CRDC, 2009). Method Execution Derection Method	concentration of a pest that can be reliably detected with a given analytical method. The performance of the analytical sensitivity was	Figure 1. Process for dispress replaining peniety of Acochyla rabies in Core and	g meske rlinum g
 Kalapis kit di na dira minima kata kata kata kata kata kata kata ka	reviewers appointed by the ISTA Seed Health Committee: Devolut Sopieska and Stephan C BRUER. A statistical centers was carried out by Kirk Bernard and Jean Louis Lafforz of the ISTA Statistics Committee.	sample size of 480 seeds are disinfected using 1% sodiam hyperblacits. All seeds are transferred to poticit decire e age: (TDN or malt age: (MA) planes and incubated for 7 days at 28 a 27 in darkness. After 7 data, each sod i sexamined by eye (Fig.	seed in a sample of 199 bashby under (0.25% of contamination). Ten seed samples with 199 bashby under some such spiked with one contaminated seed. Examination of these resulted is 100% direction of the one	econtractions and see of sample were testing the same time to waknow the representa- ing the method, and this way performed twice-between laboratories to evaluate reproductivity. All performance enter- validated with a diagnostic servitivity diagnostic see effects that method 100	the the inverse and
an analaki programma, annih, Yao meng ananga ingen transforma fan da naka da n	Chickpas Might, caused by the fungus A rabbel is one of the most series shouses and it chickpas and server epidemics have been reported workholde (None, 1982; None and Berdy, 1997; Collard et al., 2001; This pathogen is very aggressive as chickpas report and an averaf outbit in the field once	coloured raycellum and boown to dark howen pycnoldia (CML, 1972). For their examination on doubried colouries is carried our using a serverenticroscope (<25 magnification) and for a compound an invessory (<100-400 magnification).	inocularies concentration of 1.19° considiar ml was chosen. Testingten replicates of the inoculars with a concentration 32 times icore than the di-for-purpose concentration resoluted in a purpoperior reaction in 10% of	For the putlogenicity test the diagnos- sensitivity and specificity were alread validated in the analytical specificity experiment. Repeatability and repeat were validated by insting these replica a tanget and a non-target isolate at dif- tions with different operators.	r achilley ges of
	are mitable (Pearse, 2003). The crop reaction is based on the weather conditions, specific cropping proctices and the cultivar need (Markell, 2000). The forgal pathogen selectively unclose chickages plants, then	To coefform if colored so found in the detection method are able to cause plant infection, a pathogenicity test is recommended. Suspect calendar are grown on CSMDA media to encourage production of corbidia. A standard concernant sins of harvested coaldia is	produce results that do not vary, even if there are small parameter variations in the method. For the detection method, two different incolution times (7 and 9 days) were compared and in the earboarticity set.	Selection and Quality Monitorin Test Sample Sets The comparative true was conducted it globally distributed laboratories betw Jane and August 2023. Rechaldenatori	n six een
There is a big or a local is used as a set of the second s	transmission of Accordute in chickpoir over a small mamber of infected works can result in significant seeding indection in the field. Exports indicate that a 0.7% Associety infected social is non-infected work in 100 seeds, could potentially evails in 27 infected.	GJ. dupti with the root tips removed are also perpared. These seedings are soaled in the suspect per suspension insochase prior to seeding in or gather proving medium. Examination of the plantifiers is carried out after 16-days' incubation at 28-42°C and 100% B(I) dasing a covery, under 12hilph and 12h.	were compared. For both these comparisons as significant differences were observed. Disguousic avoidability is the well-facility that there are no false negatives and diagnostic quelfibility is the well-auton that there are no false positives. For the detection method,	received mine samples consulting of the median constantioned seed samples three highly constantioned seed sample and three heighly constantion (C). It shipment of the samples, the head of events and the samples, the head of events and the samples are the sample of the sample of the sample of the based of the sample part of the based of the sample part of the based of the same part of the same con-	AL les (B) for to redict neity of mined.





FINALISED:





Detection method of Ascochyta rabiei (Phoma rabiei) on Chickpea seeds











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Isabelle.serandat@geves.fr



French project Ascochyta rabiei on Chickpea seeds



Geves was part of the French research project **AsCoLuP**, led by the Technical Institute Terres Inovia

- > 2 pathogens studied: Ascochyta rabiei on Chickpea and Colletotrichum lupini on Lupin
- Aim: to provide tools to producers for the management of these diseases, both in seed production and consumption.
- Chickpea blight is one of the most serious diseases of chickpea crop. This pathogen is selectively attacking chickpea, then persists in the crop's residues, seeds, and weeds.



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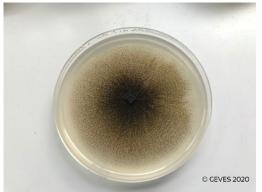
Detection method of Ascochyta rabiei on Chickpea seeds



- Geves tasks in AsCoLuP project:
 - Characterization of the genetic and phenotypic diversity of both pathogens
 - Validation of a detection method for *Ascochyta rabiei* on Chickpea
 Propose a new ISTA method on a new crop
 - ✓ To develop a resistance test in controlled conditions as support of breeding
 - Alternative seed treatments (Lupin)



KINGDOM



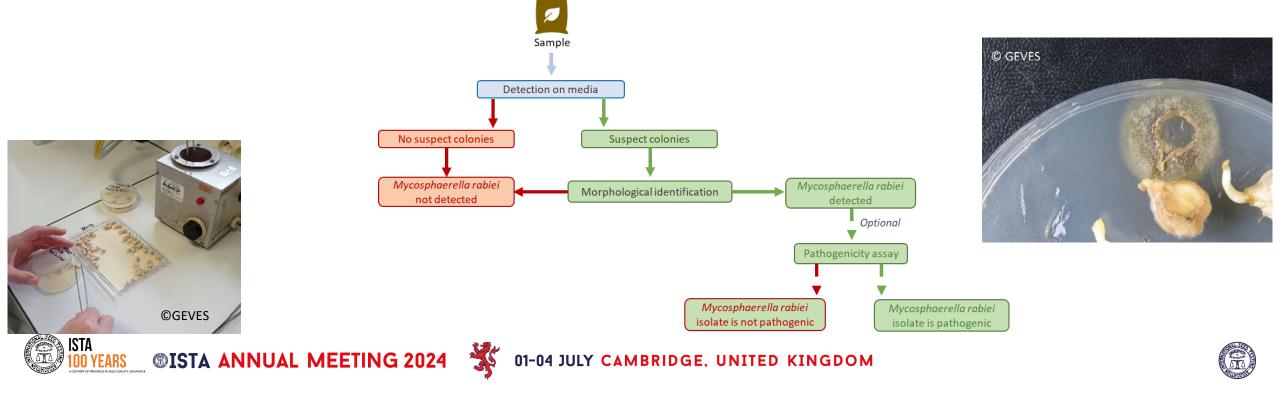






Detection method of Ascochyta rabiei on Chickpea seeds

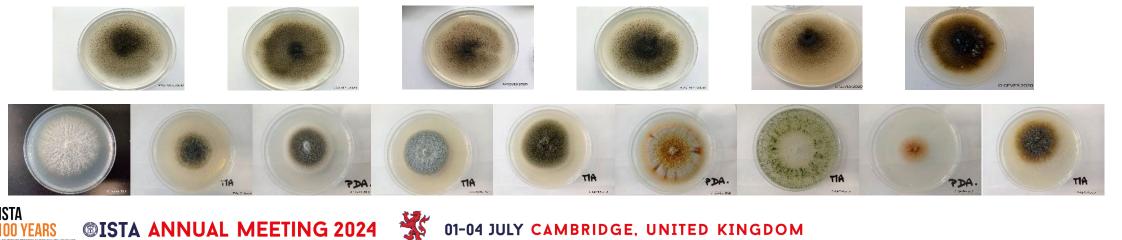
- Detection method:
 - Based on the test plan prepared by Siham Assad
 - Quantitative method
 - Agar plating and morphological identification following by a pathogenicity test (optional)

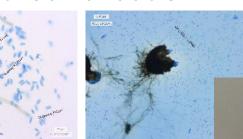




Validation of the detection method

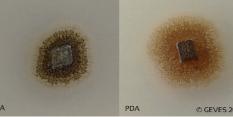
- Fest plan accepted, according to ISTA guidelines for method validation
- Seed material obtained
 - Infected seeds with different levels of infection
 - Healthy seeds
- Collection constituted and characterized
 - ✓ Targets: 20 isolates from different areas in France
 - Non targets: 20 other pathogens and saprophytes that could be present on Chickpea seeds
 - ✓ Characterisation: spore size and growth criteria on 2 media (MA and PDA)











> Analytical specificity:

- Morphological criteria described for the target
- Collection compared to the criteria
 - Targets => meet the criteria
 - Non targets => do not meet the criteria
- Result of Analytical specificity:



Target and non target strains	Expected result + (Target)	Expected result - (Non-target)	Specificity	
Obtained result +	20	0	1000/	
Obtained result -	0	20	100%	



Analytical specificity validated





Analytical sensitivity :

- ✓ Validated if 1 infected seed is detected in 400 seeds (10 replicates)
- ✓ Done by spiking: 1 contaminated seed with 399 healthy seeds (0.25%)
- To ensure a 100% contamination of the lot used for the spiking an artificial contamination has been tested and validated.
- Result of Analytical sensitivity :

Analytical sensitivity validated

Replicate	% Ascochyta rabiei
1	0.25
2	0.25
3	0.25
4	0.25
5	0.25
6	0.25
7	0.25
8	0.25
9	0.25
10	0.25







- Diagnostic sensitivity/specificity (Accuracy):
 - ✓ 1 healthy sample
 - ✓ 1 low infected sample (0.25% infection)
 - ✓ 1 medium infected sample (≈ 5% infection)

3 replicates of each level of infection tested at the same time to evaluate the **repeatability** And performed two times to evaluate the **reproducibility** intra laboratory.

Result of Accuracy:

	Expected result +	Expected result -	Diagnostic sensitivity	Diagnostic specificity
Obtained result +	6	0	100 000/	100 000/
Obtained result -	0	6	100.00%	100.00%

Accuracy validated



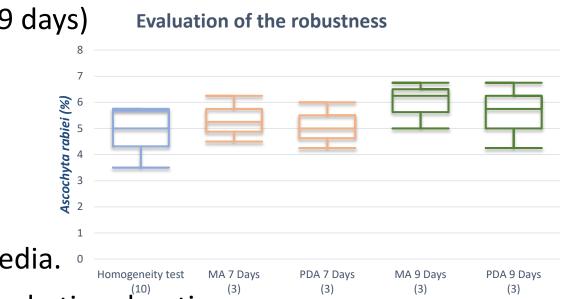




Robustness:

- A medium level infection lot (3.2%) tested
 - two different media (MA and PDA)
 - two different incubation durations (7 and 9 days)





Result of robustness

- ✓ No significant differences between the two media. ○
- \checkmark No significant differences between the two incubation durations

Robustness validated

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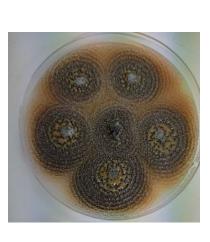


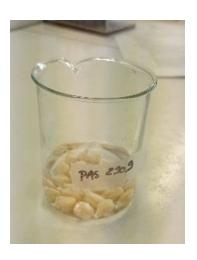
Pathogenicity pretests

- Comparison of 3 pathogenicity test methods:
 - 1. Inoculation by soaking germinated seeds in a conidial suspension (1.10⁵ conidia/m
 - 2. Inoculation by deposit of conidial suspension on germinated seeds on media
 - 3. Inoculation by deposit of conidial suspension on germinated seeds in potting soil

Inoculation by soaking germinated seeds chosen

















Analytical specificity (*Sensitivity/specificity diagnostic*):

- Performed by testing 20 target and 20 non-target isolates from the collection (1 plant per strain)
- Comparison of symptoms: presence of necrosis at the base of the stem, wilting of the leaves.

Result of Analytical specificity : \checkmark

- ✓ All targets show expected symptoms
- All non-targets show different symptoms. \checkmark

Analytical specificity validated

strains	Expected result + (Target)	Expected result - (Non-target)	Specificity
Obtained result +	20	0	1009/
Obtained result -	0	20	100%



Target

M. rabiei



Non target











Analytical sensitivity :

- ✓ 2 concentrations were tested to choose a fit for purpose concentration so that a maximum of seedlings show symptoms: 1.10⁵ and 1.10⁴ conidia/mL
- For each concentration 10 seedlings were tested compared to 10 seedlings of the negative control

Result of analytical sensitivity : Symptoms are more severe and typical on the highest

concentration (1.10⁵)

Concentration	10 ⁵	10 ⁴	NC
Rep 1	+	+	-
Rep 2	+	+	-
Rep 3	+	+	-
Rep 4	+	+	-
Rep 5	+	+	-
Rep 6	+	+	-
Rep 7	+	+	-
Rep 8	+	+	-
Rep 9	+	+	-
Rep 10	+	+	-



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Analytical sensitivity validated: 1.10⁵ concentration chosen









Repeatability/Reproducibility:

- Performed with one target (Ascochyta rabiei) and one non-target (Botrytis cinerea)
- ✓ 3 replicates have been tested at the same time and performed two times intra laboratory
- Result of Repeatability/Reproducibility:
 - All seedlings inoculated with the target strain showed symptoms
 - All seedlings inoculated with the non-target strain did not show typical symptoms

Strain	Replicate 1	Replicate 2
Ascochyta rabiei	3+/3	3+/3
Botrytis cinerea	0+/3	0+/3
Negative control	0+/3	0+/3





Target Ascochyta rabiei



Non-Target Botrytis cinerea

Negative control Repeatability/Reproducibility validated





Robustness:

- ✓ Different parameters have been evaluated :
 - ✓ Temperatures: 20°C 25°C
 - ✓ Light conditions: 8h light/16h darkness 12h light/12h darkness
- Each condition was tested on 5 seeds
- A negative control for each condition (3 seeds)

✓ Result of Robustness:

- ✓ No significant differences between the different conditions
- ✓ All negative controls conform

Temperature Light	20°C	25°C
8h light/ 16h light	5+/5	5+/5
12h light / 12h light	5+/5	5+/5



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Repeatability/Reproducibility interlaboratory:

- ✓ Validated through a comparative test, 6 Laboratories participating
 - 9 coded samples (400 seeds)
 - ✓ 3 levels of naturally contamination (medium, high, healthy)
 - Checked by homogeneity and stability test

All performance criteria validated

> New ISTA method to be voted on for publication in january 2025









ISTA ANNUAL MEETING 1-04 JULY 2024 FOR YOUR ALLOWED FOR YOUR Attention

Thank you to the myco team especially Lorine Le Dare

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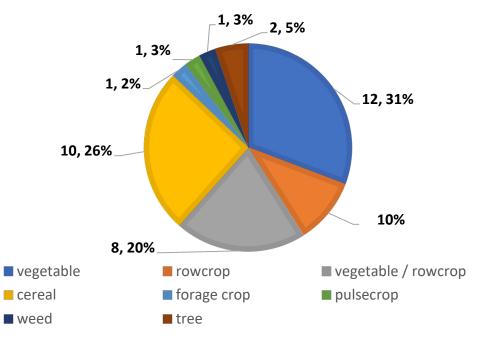
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Isabelle.serandat@geves.fr

Gap analysis SH rules / crop group

AMOUNT OF ISTA SEED HEALTH RULES PER CROP GROUP





Actions taken:

- Contacted the Chairs and Vice Chairs of the flower seed testing committee and the forest tree and shrub committee:
 - 1. To address if there is need for SH Rules for their crops
 - To identify Seed Health specialists for the crops that fall under their umbrella 2.
- Supported Nicolas Denancé (Pestlist) with finances to promote ISTA SHCOM at the IUFRO Congress



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Webinars / Workshop

Webinars

- 28 May 2024 ISSS-ISTA Webinar
- 11 July 2024 APSA Seed Technology Webinar Session 2

Seed Health Testing



Presentation by: Ruud Barnhoo /egetable Seed Pathologist

- To be announced 2024/2025 The use of statistics in validating seed health test methods
 - Collaborative action between SHCom and StatCom
 - Multiple webinars on different topics

Workshops

- Nov 2024 in collaboration with ATC, Angers, France, Insect detection in seeds
- Sep 2024, Bangalore, India, Validation, Quality assurance and Accreditation of Seed Health methods.
- 2025/ 2026 Canada, Leptosphaeria maculans and Plenodomus biglobosus in Brassica spp. seed





Special projects

ISTA Reference pest list

- Version 12 launched 24 May 2024, contains 34 crops species 411 pests reviewed
- Last year :

Dec 2023: vers. 10 – Chickpea

Feb 2024: vers. 11 – Lupin, Lentil and Potato (true seed)

May 2024: vers 12 – Cedar, Chestnut, False cypress, Poplar, Oak, Red-cedar and Walnut

Thank you Caroline Bellenot and reviewers for all your help

Project 23-1 Seed Health image collection

- Project is led by Nicole Calliou (Canada)
- Web designer Terry Harker
- ISTA assistance Sejal









ISTA Congress 2024 – Cambridge, Uk

Seed Health Testing – Image Collection Project



Nicole Calliou | July 2024





Guest speaker

Nicole Calliou Disease Diagnostics Lead SGS Nicole.calliou@sgs.com

Graduated from University of Alberta with Immunology and Infection Bachelor of Science degree, with Honors in 2010. 14 years of seed health testing, and molecular biology diagnostics, for SGS BioVision. Member of Canadian Phytopathology Society and Plant Pathology Society of Alberta. Accredited by Canadian Food Inspection Agency for *Ustilago nuda* detection in Barley.

ISTA lead for special project – Seed Health Image Database construction (expected to be live mid-2024).

Lead on green lab initiatives at Sherwood park, achieved LEAF Gold certification in 2023.







Terry Harker

Website Designer and Developer, Co-Founder of byteKultur

terry.harker@bytekultur. net



Sejal Patel

IT Business Solutions Manager at ISTA

Sejal.patel@ista.ch



Ruud Barnhorn

ISTA Seed Health Committee Chair

r.barnhoorn@naktuinbou w.nl



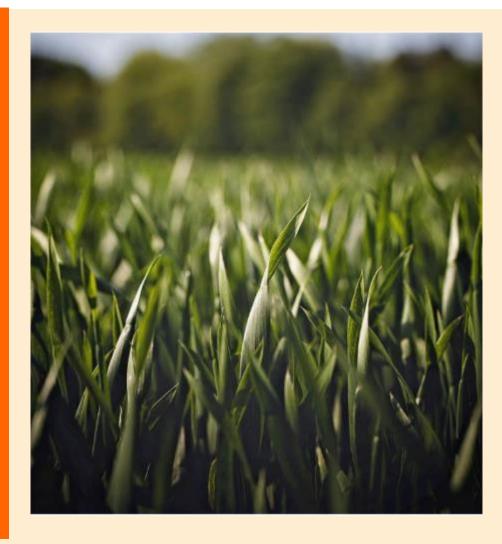
Nicolas Denancé

GEVES Seed Health Deputy Manager and Nematology Activity Manager

nicolas.denance@geves .fr



4 yellow slides are from 2022 presentation – Why we need to collect images, to minimize differences across labs



Contents – Initial Proposal (2022)

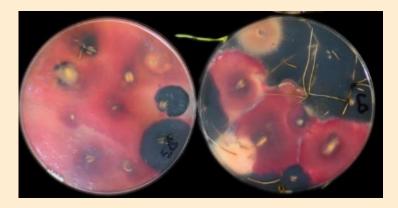
Purpose

- Goal ISTA Reference Pest List
- Factors to consider
 - Agar
 - Chamber Lighting
 - Chamber Temperature
 - Growth Time
 - Spore Images



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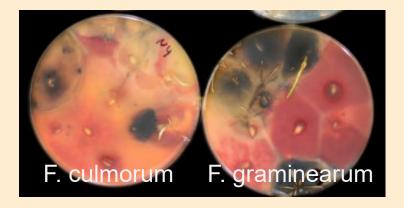
Why should we share 'extraneous' data on images?



PDA - Difco

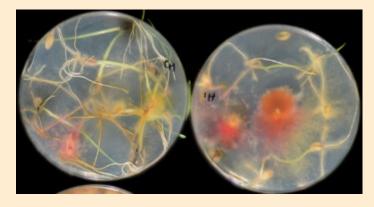
 Good fungal growth. Strong pigment production. Good spore production.

Agar 15 g/L Dextrose 20 g/L Potato Extract/Starch 4 g/L



PDA - Neogen

 Good fungal growth. Range of colours produced by Fusarium species - Fusarium culmorum obviously 'orange'. Good spore production.



PDA - Homemade

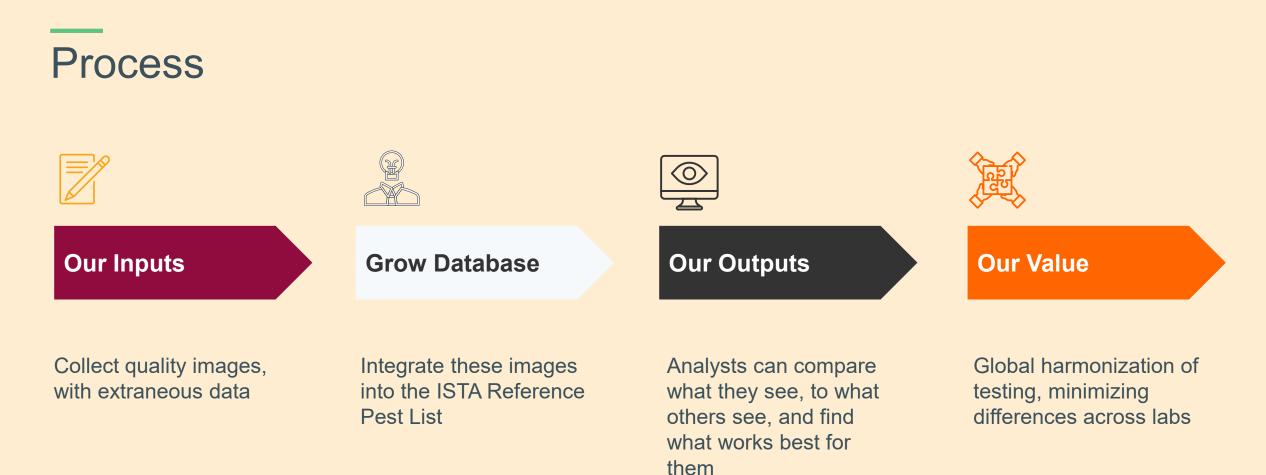
 Weak growth of fungal colonies. Poor colour production. Good spore production.



Relevant Information - Discuss

- Images need to include:
 - Pathogen name, and host
 - 2 pictures, top and bottom
 - Agar used (& Manufacturer)
 - Growth conditions (temp/lighting)
 - Growth time (# of days)
- Images should include:
 - Spore image (with scale bar)
- Additional information:
 - Genetic information (primers/probe sequence, PCR conditions)
 - Verbal description









Contents – Seed Health database

- Why an image database?
- Introduction to the website:
 - Search features
 - Sample Image Submission
 - Nematode Image Submission
 - Plant/Seedling Health Image Submission
 - 'Extraneous' info collected
- Milestones to meet
 - ISTA Chapter 7
 - ISTA Reference Pest List



Why an Image Database?



Training challenges



Artificially inoculated seed



Poor published images

Reference isolates

Multi infections



Climate change



International trade



Disease pressure – monoculture, irrigation, rotation, new crops



Website Introduction

- www.seedhealthtestimagedb.info
- Home: Search
- Submit
 - Sample Images
 - Isolate or Nematode Images
 - Seedling/Plant Images

The most comprehensive source of seed pathology knowledge in the world

STO

0

6

THE PLATFORM



A searchable, online image database, with detailed information on pathogen growth influences.

Researchers can submit images to share their knowledge and data with the world. Our team of experts will review them for accuracy before publishing on the website.

WHY CHOOSE US?

This website efficiently bridges the knowledge gap between experts and young scientists. It's accessible to all, accepting image and data submissions from any researcher for free.



www.seedtest.org

www.seedhealthtestimagedb.info

contact@seedhealthtestimagedb.info

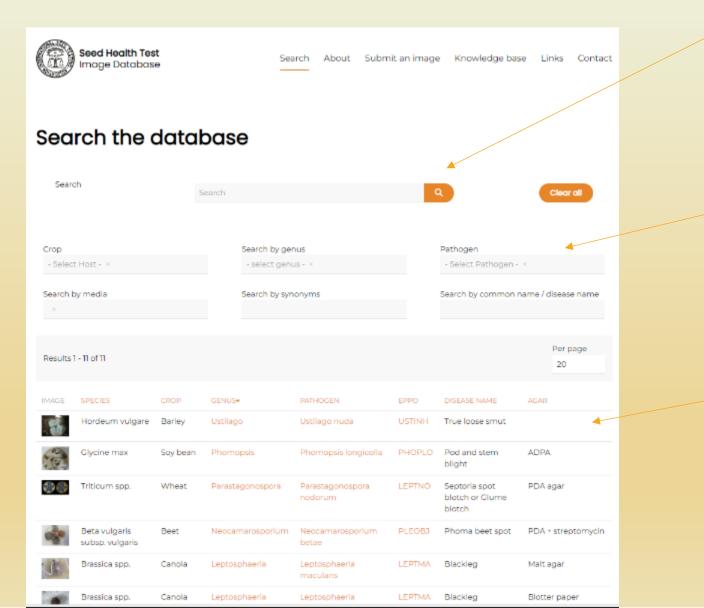
It began with PDA (Potato Dextrose Agar). A manufacturer altered their formulation to cut costs, resulting in significant changes in culture color and morphology despite ostensibly keeping the ingredients and concentrations the same. This prompted an investigation into whether other labs were aware of the potential impacts of manufacturing changes.

ISTA promotes information sharing, disseminates knowledge, and trains young seed pathologists. However, the current reference images lack crucial details. Prioritising the education of future plant pathologists is essential amid concerns about food security and seed health.

We prioritise seed quality through standardised testing in any accredited lab to ensure consistent results. Comprehensive training encompassing all factors influencing pathogen growth in the lab is essential. Our experts will review the images you submit, fostering shared knowledge and mutual benefits.

You should find one of these in your welcome bag





User Type 1: Knows (or thinks they know) exactly what they have and just wants to spend an extremely short amount of time to find comparable images

User Type 2: Has limited knowledge of what they have (may only know Crop, or Genus, etc.). Able to layer drop downs to reduce image results

User Type 3: Has no idea what is going on, wants to see every image ever uploaded. Doesn't want to miss a thing





Submit your images to our database

What kind of imagery are you going to submit?



Sample Images

Pathogen and/or Saprophyte growth information known. Please upload images of top (minimum submission) and bottom, including microscopy images if possible.

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Isolate or Nematode Images

Taken from a microscope. Limited information known on growth conditions and/or crop.



Infected plant material

Pictures of plant infected parts taken with your camera



Not sure how to proceed?

Find tips and answers in our Knowledge Base and our FAQ section.



SeedHealth Test

Image Database © 2024 all rights reserved. Powered by ISTA



Engage

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Spread the word



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Submission

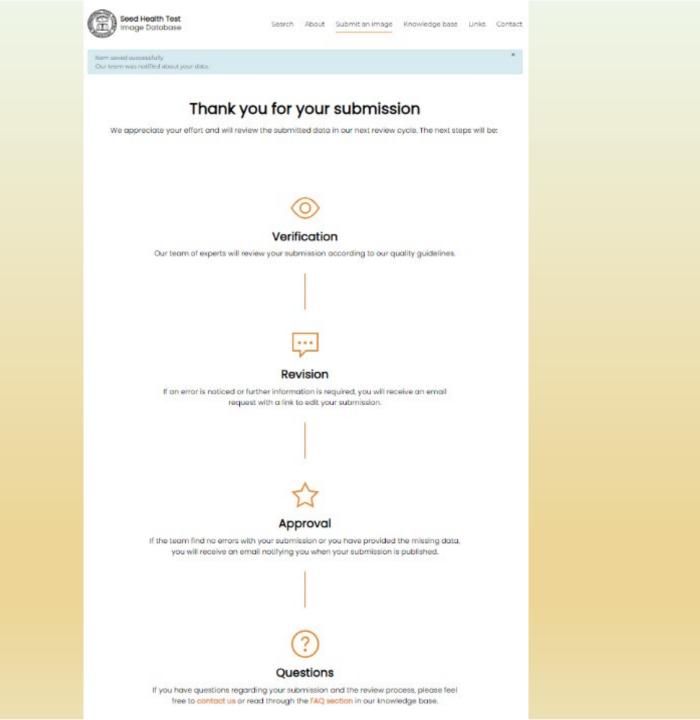
Submission

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Submission





Submission Email – to Approvers/Reviewers

New submission - your approval is needed on Seed Health Test Image Database by ISTA			
S	Seed Health Test Image DB (DEV) To: Nicole Calliou	← Reply ≪ Reply all → Forward 🔠 ···· Wed 6/12/2024 9:32 AM	
	Dear Nicole Calliou, there is a new submission on Seed Health Test Image Database by ISTA. After loggin in https://seedhealthtestimagedb.info/review?id=3	n, you can review it via the following link:	
	\leftarrow Reply \rightarrow Forward		





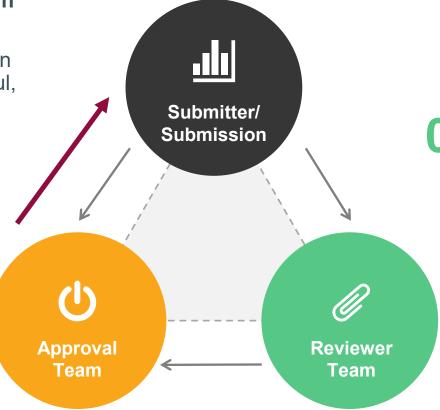
01 A Submitter uploads images in a submission to the website

Submitter will receive notification if the submission was successful, as well as instructions notifying them their submission will be reviewed.



Approval Team

Submission is accepted and published on website, or notification is sent to submitter asking for editing. Admins are able to make edits directly in backend of website, if necessary.



02 Reviewer Team AND Approval Team receive email notification

> 2 weeks are allowed before a decision must be made to reject or accept submission.

Ideally, each submission has 3 different people approve it, prior to publishing



The Review Team



Dorota Szopinska

Seed pathology specialist, Poznań University of Life Sciences and ISTA Seed Health Committee Member

Dept in China Agricultural

University (CAU). Vice Director

of Seed Health Center, CAU



Shaista Karim, Ph.D.

QC Seed Pathology Tech Lead at Bayer Crop Sciences



Dipl.-Ing. Angela Thueringer

Seed Health Analyst at AGES, Vienna



Rosa Piña

Pinto Piga Seeds S.A. and ISTA Seed Health Committee Member



Annu Albert, M.Sc. Disease Diagnostics at SGS



Xiulan Xu

Associate Researcher, Beijing Vegetable Research Center and ISTA Seed Health Committee Member



Ernestine Lippert



Luciana Ferrand

Plant Pathologist at INASE and ISTA Seed Health Committee Member



Miriam Lechner





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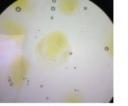
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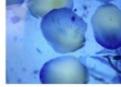
An email was just sent to your inbox with a temporary editlink. Please edit your submission in the next 30 minutes because the link will expire after that.

Submission Review Ustilago nuda (USTINH)

Images

Submission Editing





Perspective: top Magnification: x25

x25 Perspective: top Magnification: x25

About the Sample

Pathogen	Ustilago nuda (USTINH)
Crop	Barley (Hordeum vulgare)
Description	Barley embryos isolated according to ISTA 7-013. I)Infected, unstained embryo showing golden brown hyphae in scutellum 2) Infected embryo with Methyl Blue stain
Country of origin	Canada

About the owner

Ownership Nicole Calliou, SGS

Owner Email Nicole.Calliou@sgs.com

Manage your submission

ID: 2

Created: Monday, 10 June 2024 19:25 x

Reviewer: Annu Albert

Comment by the review team

Review decision rejected (to improve)

Reviewer Comment

Although it would look similar to the methyl blue image, another image with trypan blue staining would be good since that is a common method used in many labs. AA

What to do next?

Request editing

What does that mean? +





[EXTERNAL] Edit your submission on Seed Health Test Image DB (DEV)

Seed Health Test Image DB (DEV) <contact@seedhealthtestimagedb.info> To O Calliou, Nicole (Sherwood Park)

(i) This sender contact@seedhealthtestimagedb.info is from outside your organization.

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Someone has requested a link on Seed Health Test Image DB (DEV) to edit a submission. If this was you, you can edit your submission with the followint link: https://seedhealthtestimagedb.info/edit-submission. If this was you, you can edit your submission with the followint link: https://seedhealthtestimagedb.info/edit-submission. If this was you, you can edit your submission with the followint link: https://seedhealthtestimagedb.info/edit-submission. If this was you, you can edit your submission with the followint link: https://seedhealthtestimagedb.info/edit-submission. If this was you, you can edit your submission with the followint link: https://seedhealthtestimagedb.info/edit-submission. If this was not you, please ignore this email.

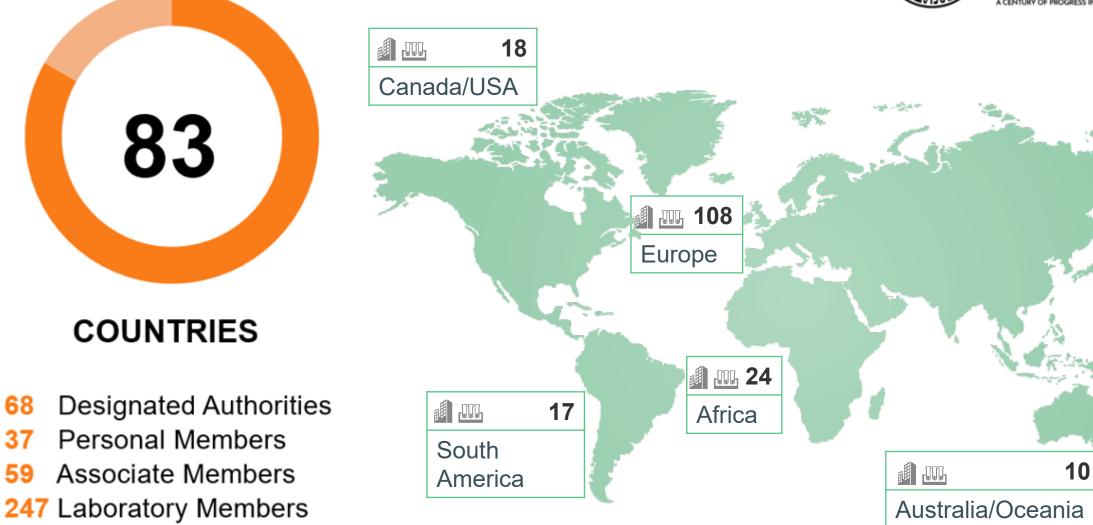




SH



Asia/Pacific



Milestones – Solicit Image Submissions



- ISTA Chapter 7 Pathogens
- ISTA Member labs have been requested to assist



- ISTA Reference Pest List
- Researchers from around the world are able to submit images to achieve this goal



- Pathogens of significance (Location dependent)
- Saprophytes (as per request at 2022)



Path to Success



Questions?

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