



AsiaBlight Update EuroBlight Workshop 10th May 2022

Louise Cooke, Philip Kear, Zhenxin Zhang, Jorge Andrade-Piedra

- **May 2019:** presentation on AsiaBlight at EuroBlight, York
- **October 2019:** AsiaBlight conference in Beijing
- **2020-2022:** major changes within CIP in terms of personnel and restructuring as part of One CGIAR, still ongoing
- **May 2021:** update on AsiaBlight at online EuroBlight meeting
- **December 2021:** AsiaBlight update at online Global Networks meeting
- Where is AsiaBlight now?
- We have a structure, see <https://www.asiablight.org/>
 - Coordination committee
 - Scientific committee
 - Regional Representatives

Meet AsiaBlight Coordination Committee at CIP



Oscar Ortiz

Deputy Director General for Research and Development

 CIP, International Center of Potato, Lima, Peru



Xiaoping Lu

Deputy Director General for CCCAP

 CIP-CCCAP, International Center of Potato, China Center for Asia Pacific
Beijing, China



Philip Kear


China Liaison Scientist

 CIP-CCCAP, International Center of Potato, China Center for Asia Pacific
Beijing, China



Jorge Andrade-Piedra

Plant Pathologist

 CIP, International Center of Potato, Lima, Peru

Meet AsiaBlight Scientific Committee 2021-2023



Pham Thi Thu Huong, PhD

Agricultural Researcher, Field Crops Research Institute



Sanjoy Guha Roy, PhD

Head of Department of Botany, West Bengal State University



Tongle Hu, PhD

Professor Plant Pathology, Hebei Agricultural University (HEBAU)



Seishi Akino, PhD

Professor Plant Pathology, Hokkaido University
 Sapporo, Japan



Mohammad Rashidul Islam, PhD

Regional Representatives

- Bangladesh (Mohammad Rashidul Islam)
- China (Xingbin Che)
- Georgia (Zurab Khidesheli)
- India (Sanjoy Guha Roy)
- Indonesia (Tarkus Suganda, Ani Widiastuti)
- Japan (Seishi Akino)
- Korea, Republic of (Samnyu Jee)
- Nepal (Buddhi Prakash Sharma)
- Pakistan (Waqas Raza)
- Philippines (Teresita Masangay)
- Taiwan (Ricardo Oliva, Wallace Chen)
- Tajikistan, Kyrgyzstan (Saltanat Mambetova)
- Uzbekistan (Mukhtabar Tashmatova)
- Vietnam (Pham Thi Thu Huong)

Progress during 2021-2022

- Zhenxin Zhang joined CIP team in China as a post-doc
- Online meetings of Regional Representatives, Scientific Committee and Coordination Committee, areas of cooperation and work plan agreed
- AsiaBlight-China very active
- Online AsiaBlight meeting 11th January 2022 included updates from Sanjoy Guha Roy on progress in India and from Zhenxin Zhang on genotyping
- Representatives requested details of AsiaBlight China's activities, particularly interaction with agchem companies and funding
- Mr Che (Regional Representative China) gave an online presentation to AsiaBlight Reps 10th March 2022

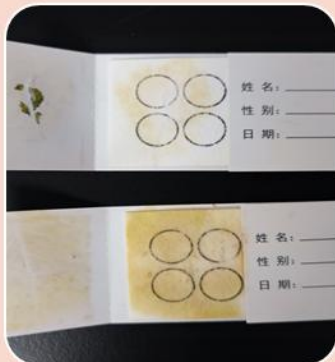




AsiaBlight Network in CHINA

Che Xingbi
Regional Representative
Visiting Scientist of CIP





Pathogen Research

- CIP-CCCAP continues to receive FTA cards from China as well as elsewhere in Asia

Fungicide Evaluation

- Support of 4 Chinese Companies
- Test 14 fungicides
- tested in 3 provinces: Inner Mongolia, Yunnan and Hebei.

Training

- Performed training on 5 occasions in 4 provinces

Host Resistance

- Working with 2 Chinese partners to breed LB resistant varieties in Enshi and Inner Mongolia.

DSS

- DSS network has continued to expand. Currently supported by a model introduced from Belgium (CARAH)

What is AsiaBlight China?

- Priority and Mission: To concentrate on field problems and help farmers
 - Based on an assessment of Chinese farmers' needs

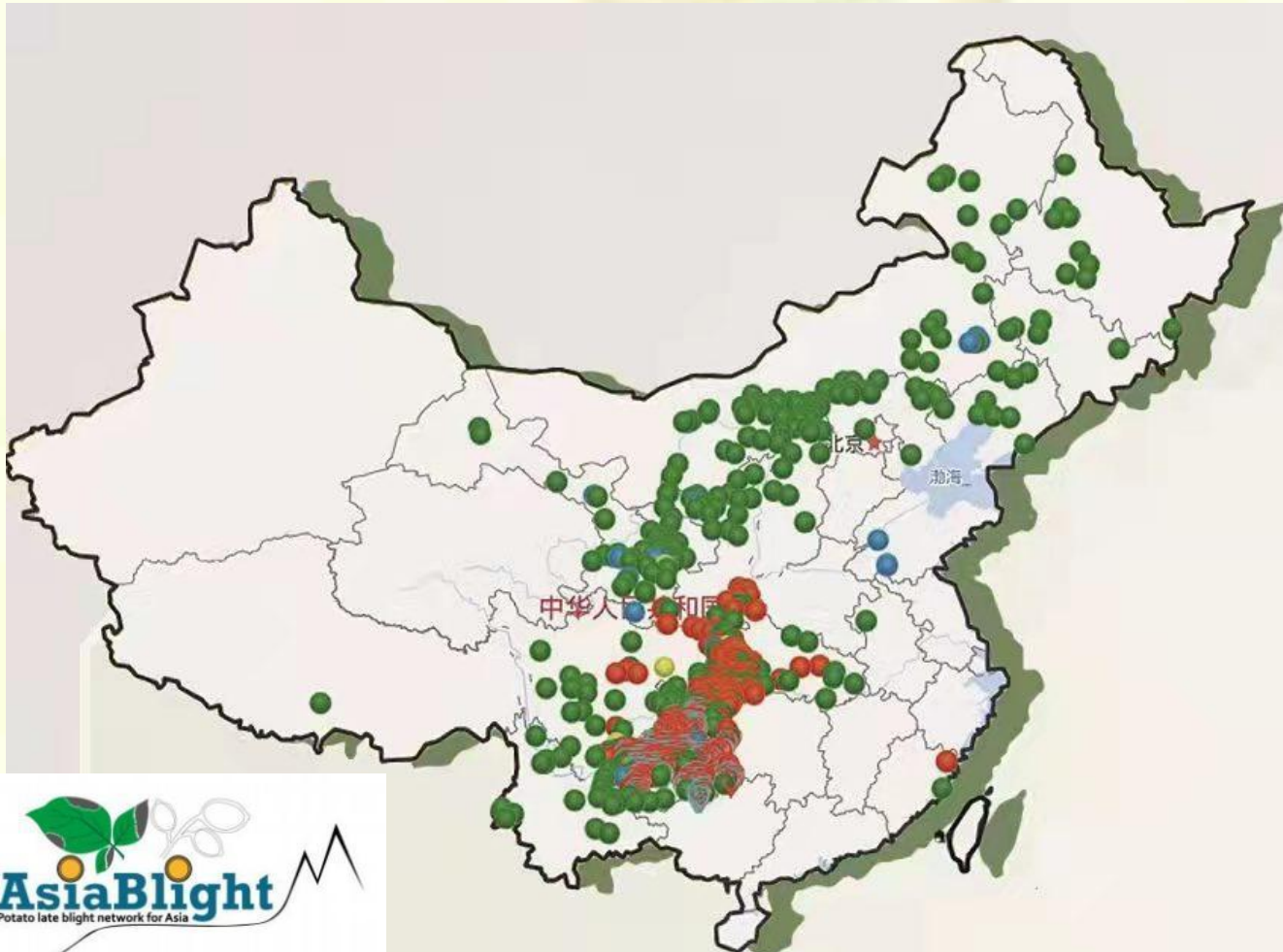


- Warning System against PLB in China using Belgian Carah model
- Farmer training
- Host resistance breeding
- Interaction between AsiaBlight China and Fungicide Companies (3 or 4 companies annually)

Warning System against PLB in China

- **Network of Monitoring Devices**

- Around 900 monitoring sites in China
- Farmers advised via mobile phone app



Farmer training on prevention and control of late blight

- Eight training sessions and three on-site symposia were held around China
- These allowed 90+ professionals to provide technical support and training for more than 1,000 local agricultural technicians and farmers



Host resistance breeding

- Led by Philip Kear, CCCAP Country Liaison Scientist
- Uses CIP's breeding resources
- Involves two research institutes and two universities



Fungicide Evaluation

- Mr Che presented results with 'Shudakang' marketed by Yadayinong Agricultural Technology Co.
- Shudakang contains the plant extract eugenol (present in essential oils e.g. clove oil) plus the fungicide dimethomorph
- Interest from other countries in Asia in evaluating this product



AsiaBlight progress in population studies

- Zhenxin Zhang joined CCCAP (CIP-China Center for Asia Pacific) in Beijing as a postdoc in February 2021
- Has successfully implemented 12-plex genotyping at CCCAP
- David continues to provide advice and interpretation of outputs



AsiaBlight progress in population studies

Progress in population studies 2019-2022

Distribution of FTA Cards

2019 | Sent: China (139), Vietnam (12), Pakistan (50)*, Philippines (20)
Returned: China (73)

2020 | Sent: China (50)
Returned: China (23), Vietnam (2)

2021 | Sent: China (80)
Returned: China (105)

Total | Sent: China (269), Vietnam (12), Philippines (20)
Returned: China (201), Vietnam (2), Philippines (0)

Finished analyzed

120

203

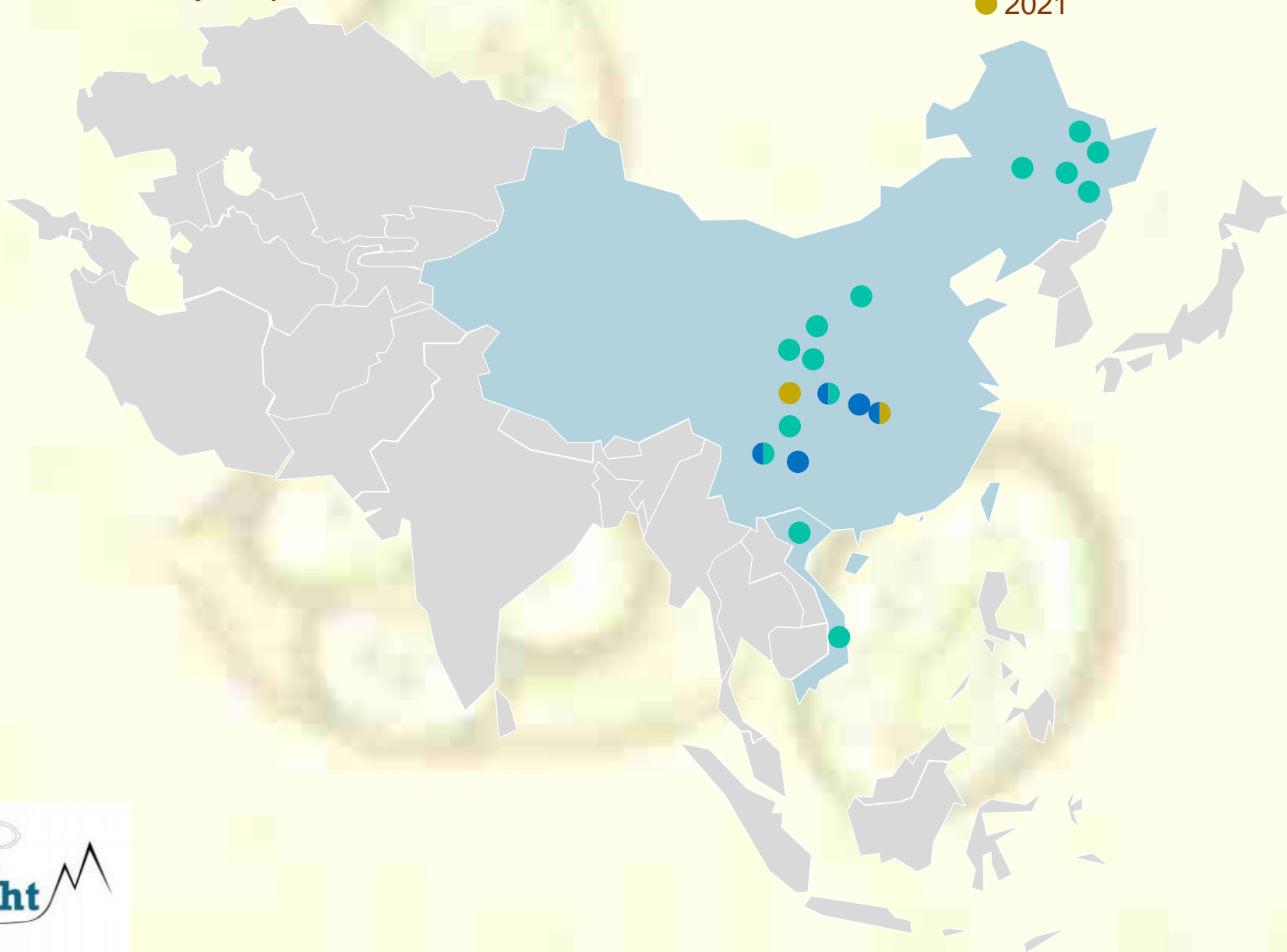
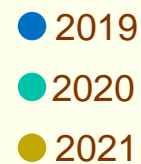
In total



* cards from Pakistan returned to JHI and genotyped there

Sample collection 2019-2021

- Reduced by impact of Covid-19



Genotyping 2019-2021

- EU_13_A2
- SIB-1_A1
- US-11
- chk
- other

Hubei Province, China (29)

EU_13_A2
2019, 2021

Heilongjiang Province, China (50)

SIB-1_A1, EU_13_A2,
chk, US-11
2020

Shaanxi Province, China (3)

SIB-1_A1
2020

Yunnan Province, China (5)

EU_13_A2
2019

Gansu Province, China (9)

EU_13_A2
2020

Chongqing, China (9)

SIB-1_A1, EU_13_A2
2019

Ningxia Province, China (7)

EU_13_A2
2020

Sichuan Province, China (6)

EU_13_A2, SIB-1_A1,
chk
2019, 2020, 2021

Heilongjiang Province, N=50

Gansu Province, N=9

Ningxia Province
N=7

Shaanxi Province, N=3

Sichuan Province, N=6

Hubei Province, N=29

Yunnan Province, N=5

Chongqing, N=9

Vietnam, N=2

Tỉnh Bắc Kạn, Vietnam (1)

US-11
2020

Tỉnh Đắk Lắk, Vietnam (1)

EU_13_A2
2020

Genotyping 2021 - China

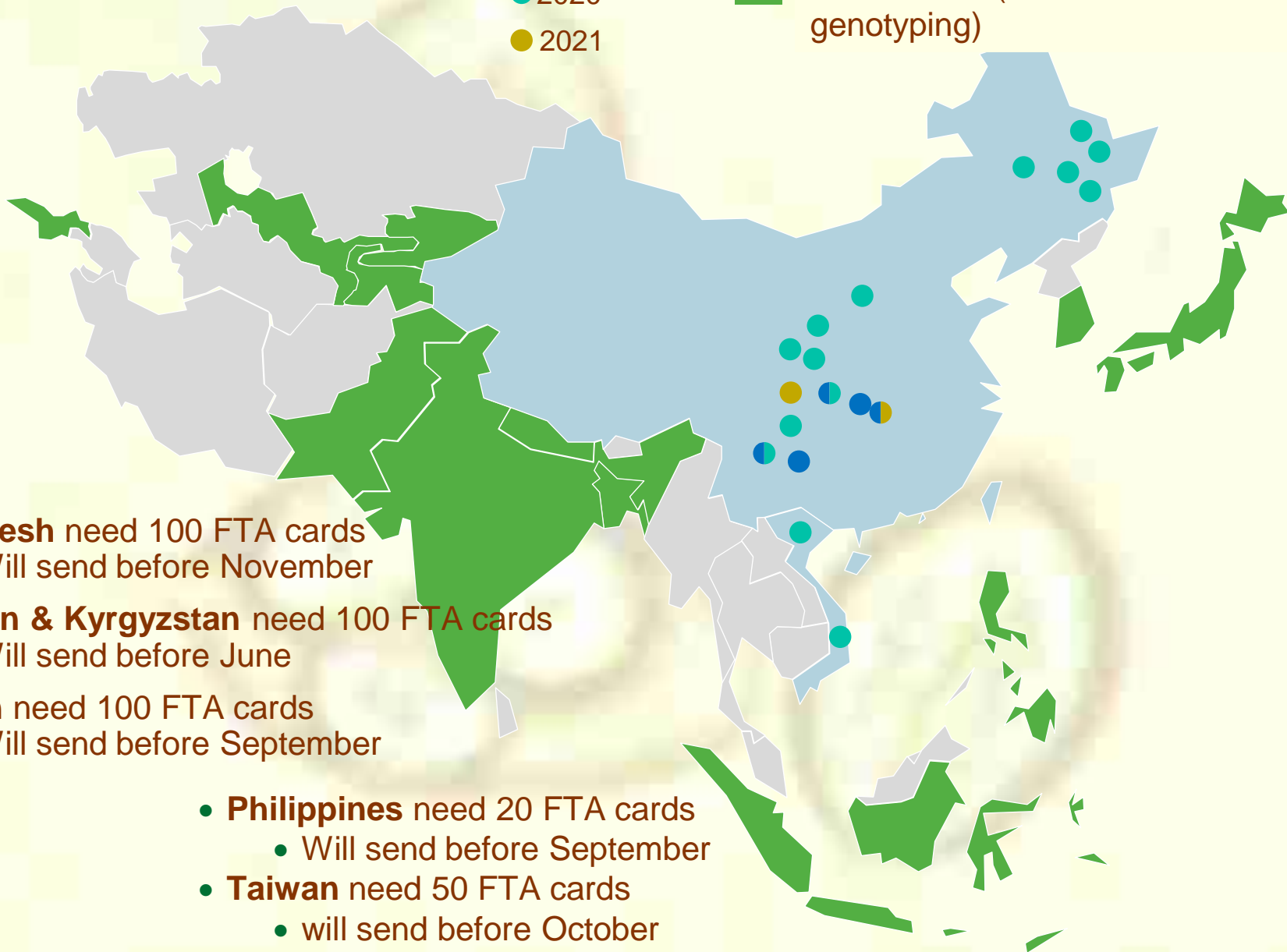
Summary from David

- 203 genotyped samples examined (sent as .fsa files)
- 94 failed (too weak)
 - 110 assigned genotypes
 - 83 EU_13_A2 with many minor variants at G11, D13, SSR4
 - 21 SIB_1_A1
 - 2 US_11
 - plus 4 EU_8_A1 standards

2022 update

● 2019
● 2020
● 2021

■ Countries which will be sampled in the future (some do their own genotyping)



- **Bangladesh** need 100 FTA cards
 - Will send before November
- **Tajikistan & Kyrgyzstan** need 100 FTA cards
 - Will send before June
- **Pakistan** need 100 FTA cards
 - Will send before September
- **Philippines** need 20 FTA cards
 - Will send before September
- **Taiwan** need 50 FTA cards
 - will send before October
- **Vietnam** do not need FTA cards this year

Asia Genotyping all years

Continent
South/East Asia

Year

- ☒ All
- ☒ 2019 ☒ 2018
- ☒ 2017 ☒ 2016
- ☒ 2015 ☒ 2014
- ☒ 2013 ☒ 2012
- ☒ 2011 ☒ 2010
- ☒ 2009 ☒ 2008

Host

- ☒ All
- ☒ Potato ☒ Tomato

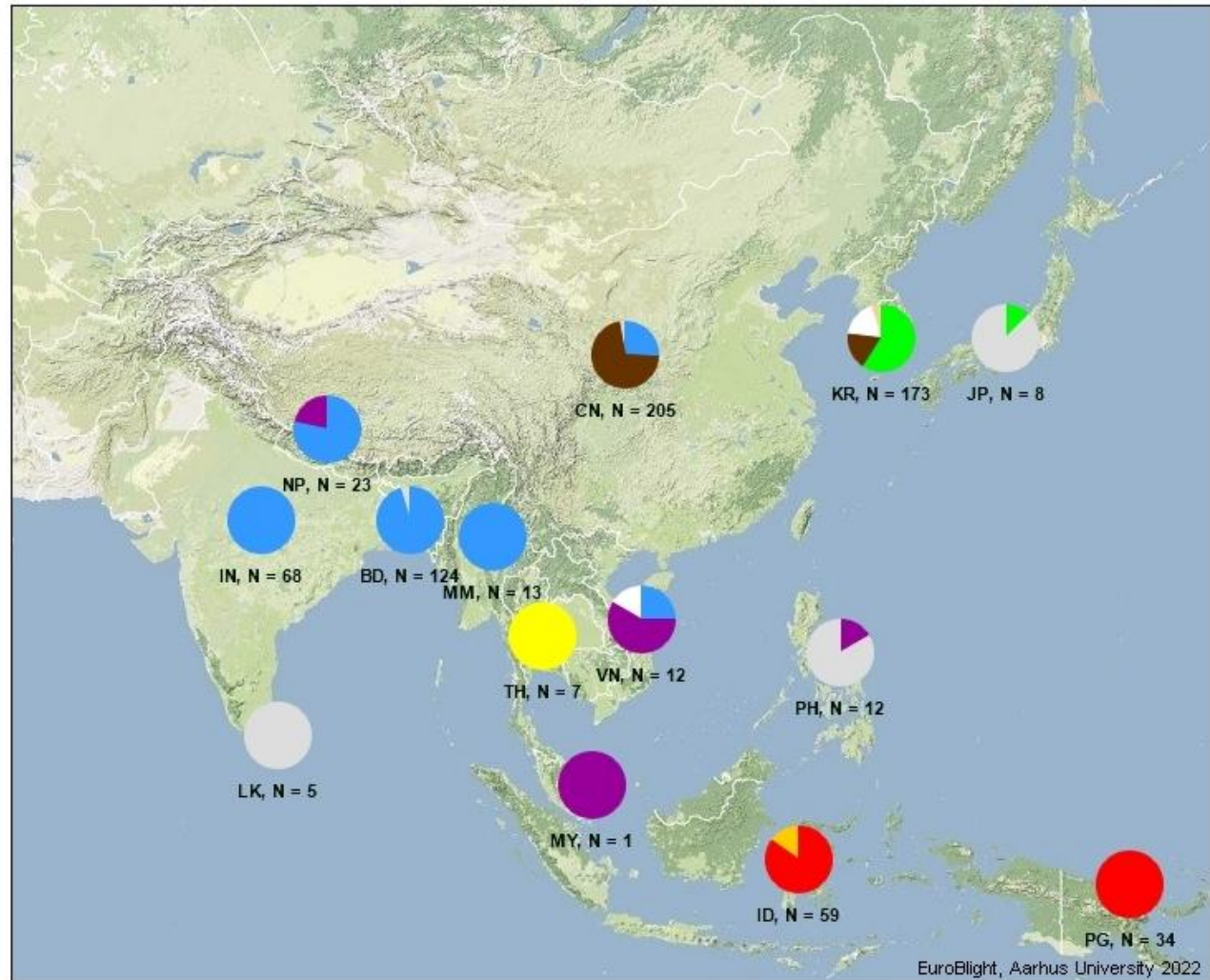
Show

Genotype legend ?

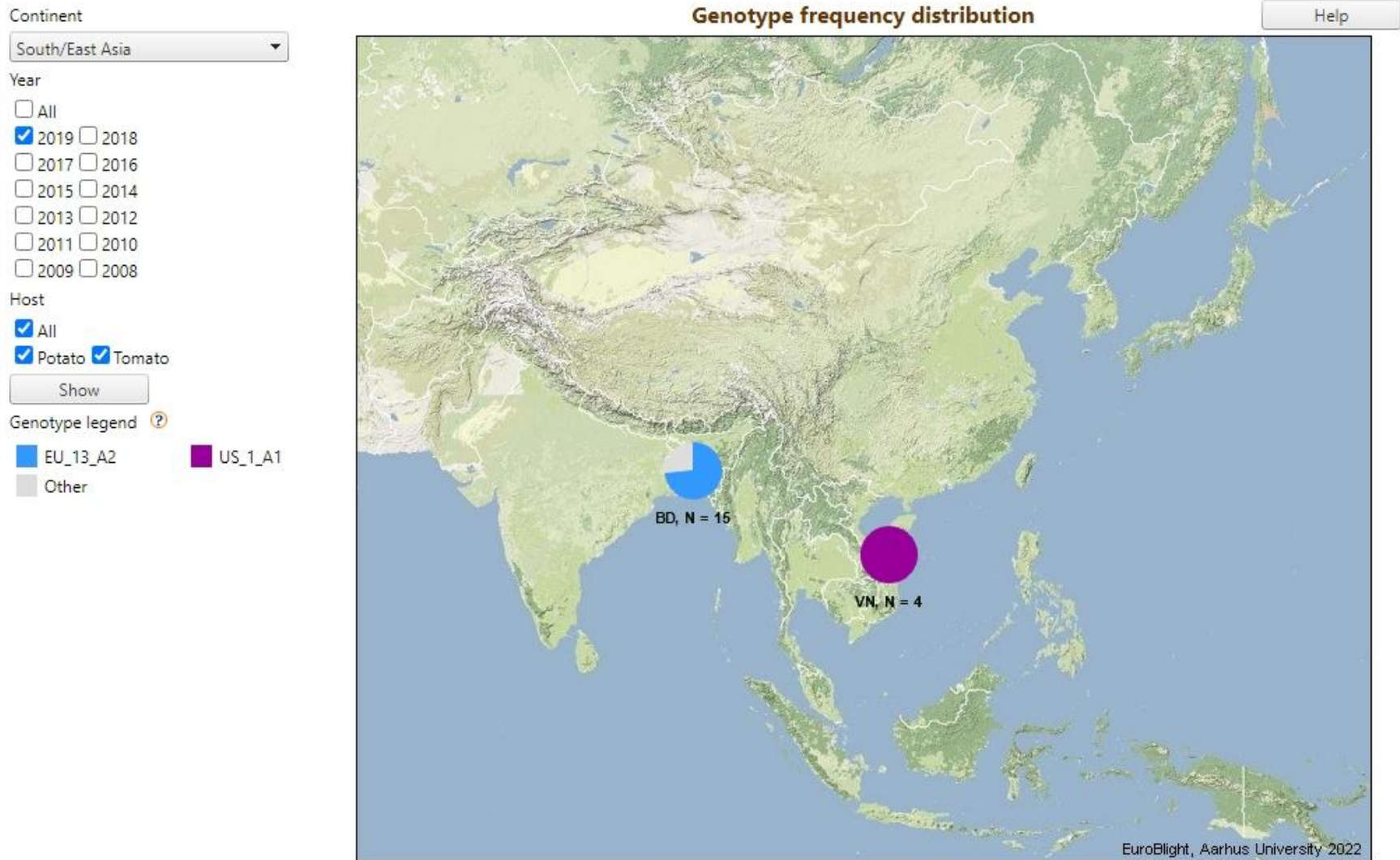
- | | |
|---|--|
| ■ EU_2_A1 | ■ EU_8_A1 |
| ■ EU_13_A2 | ■ KR_1_A1 |
| ■ SIB_1_A1 | ■ US_1_A1 |
| ■ US_11_A1 | ■ JP_1_A2 |
| ■ AU_1 | ■ Other |

Genotype frequency distribution

Help



Asia Genotyping 2019 -



AsiaBlight recent genotyping samples not yet uploaded to EuroBlight map

Other Outputs - publications produced with the assistance of the AsiaBlight network

- Guha Roy *et al.* (2021) The dynamics of *Phytophthora infestans* populations in the major potato-growing regions of Asia - A review. *Plant Pathology* 70, 1015-1031.
- Raza *et al.* (2021) Mating Type and Aggressiveness of *Phytophthora infestans* (Mont.) de Bary in Potato-Growing Areas of Punjab, Pakistan, 2017–2018 and Identification of Genotype 13_A2 in 2019–2020. *Potato Research* 64, 115-129.
- Huzzatal Islam *et al.* (2022) Phenotypic and genotypic analysis of the population of *Phytophthora infestans* in Bangladesh between 2014 and 2019. Submitted.
- Forbes *et al.* A Global Database of Host Plant Resistance to *Phytophthora infestans* in 10 countries from Asia. In preparation.
- Cooke *et al.* The challenges of developing a coarse-scale map of the *Phytophthora infestans* population in Asia for the AsiaBlight network. In preparation.

Next steps for AsiaBlight

- Sample collection and genotyping need to be better standardised
- Discussion on switching from SSR to SNPs, but keeping sample collection using FTA cards
- Needs and opportunities from partners
- Enhanced collaboration with the World Vegetable Center, Taiwan in tracking *P. infestans* genotypes on tomato and potato
- Network of reference labs for pathogen characterization?
- Discussion point: as noted by Guha Roy *et al.* (2021), the single most important factor for population change in Asia is migration of *P. infestans* genotypes from Europe and the Americas.
 - What is the role of the seed trade?
 - How to prevent the spread of new genotypes?
- Your comments and ideas are welcomed!
- **Thank you for your attention!**



The International Potato Center (known by its Spanish acronym CIP) is a research-for-development organization with a focus on potato, sweetpotato, and Andean roots and tubers. CIP is dedicated to delivering sustainable science-based solutions to the pressing world issues of hunger, poverty, gender equity, climate change and the preservation of our Earth's fragile biodiversity and natural resources.

www.cipotato.org



CIP is a member of CGIAR

CGIAR is a global agriculture research partnership for a food secure future. Its science is carried out by the 15 research centers who are members of the CGIAR Consortium in collaboration with hundreds of partner organizations.

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