



PIG PROGRESS

EQSP Forum, Québec Pork Show
Québec City, QC | Canada | December 10, 2024
Vincent ter Beek, editor, *Pig Progress*

Global
situation
of **ASE**



DAIRY GLOBAL

PIG PROGRESS

ALL ABOUT FEED

POULTRY WORLD

FUTURE FARMING



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Introduction



A few words about *Pig Progress*



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DAIRY GLOBAL
ALL ABOUT FEED
PIG PROGRESS
POULTRY WORLD
FUTURE FARMING

MISSET

Introduction

- 48 years old
- History & Journalism (Netherlands)
- Postgraduate Newspaper Journalism (UK)
- College teacher (2002-2003)
- Local journalism (2000-2005)
 - *De Twentsche Courant Tubantia*
 - *Provinciale Zeeuwse Courant*
- Trade journalism (2005-2024)
 - *Pig Progress*





Farm visits





Global thoughts



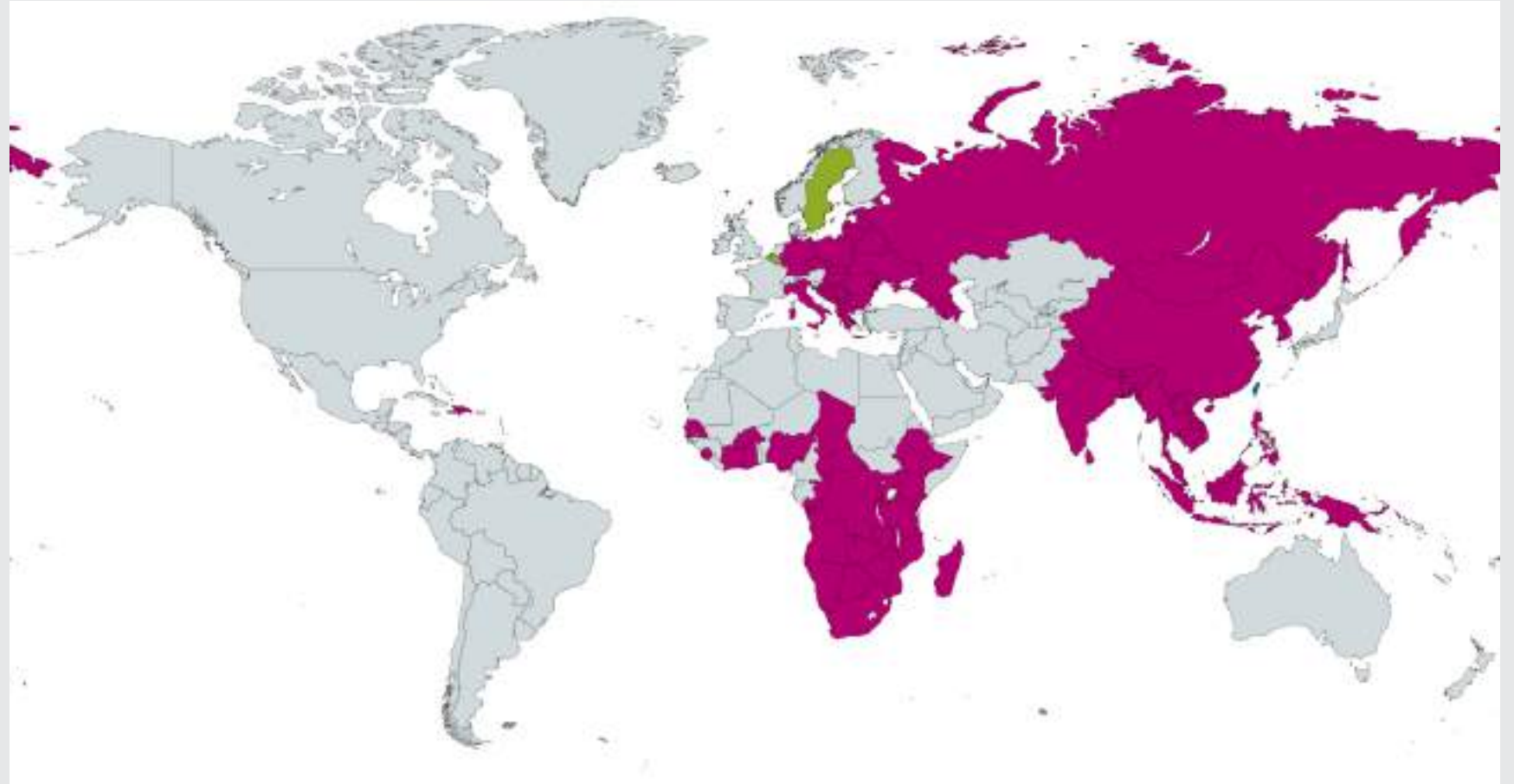


Global overview – Some thoughts

- Collecting **international** ASF outbreak data – map making
 - WOAHA
 - Local authorities
 - Social media
- The **paradox** of reporting
- **Human** behaviour and reflexes
 - Sell before it is too late
 - Improper disposal of carcasses
 - Keeping quiet
 - Mass hunting
- The virus needs a biological **reservoir**

Global overview

- Reported ASF since 2007
- Reported ASF since 2007 – and were declared free
- Infected carcasses washing up, no ASF inside country





Poll question

How often has ASF virus successfully crossed the Atlantic?

- Once
- Twice
- Three times
- Four times



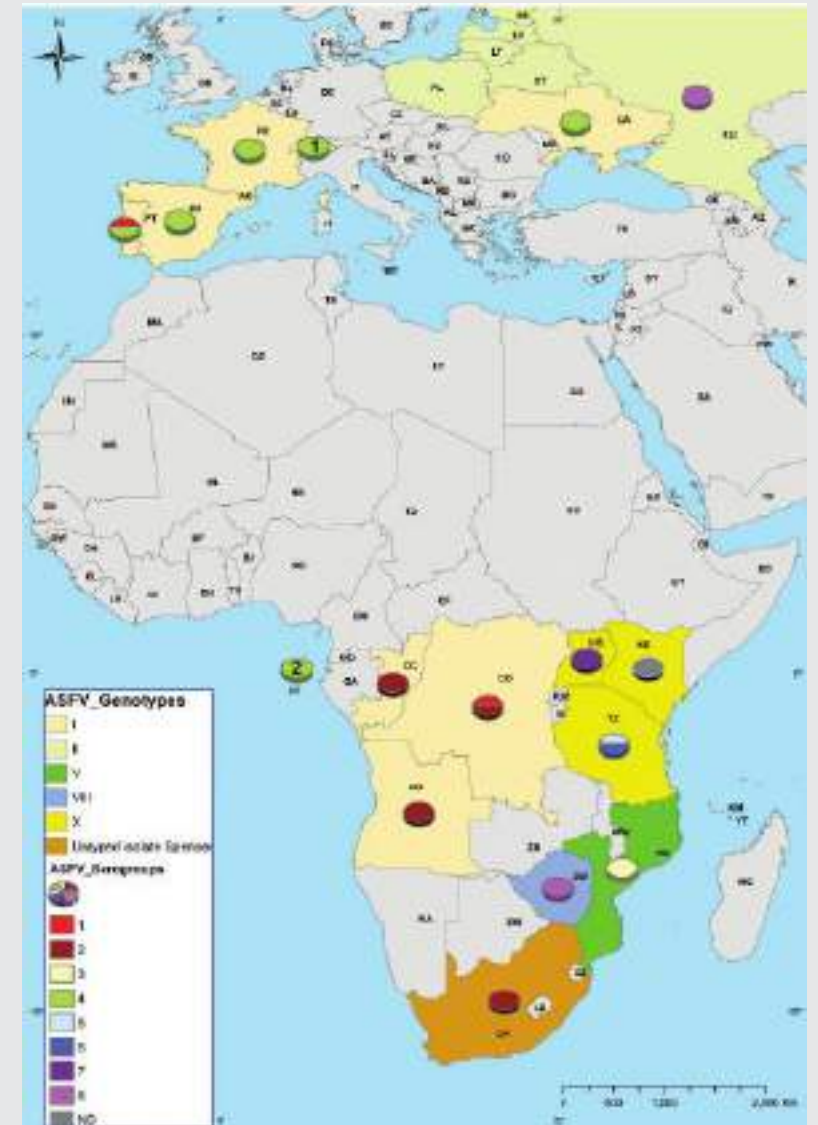
Africa



Africa

- First described in **Kenya** in 1921
- Endemic in **sub-Saharan Africa**
- “Sylvatic cycle,” including immune **warthogs** as well as **soft ticks** (*Ornithodoros*)
- Remained “**uninteresting**” for a long time
- **Genotype I** spread out over western Europe (and the Americas!) from 1957 until 1995
- Genotype I was still endemic at **Sardinia** until this summer
- Currently **genotype II** all over the planet
- **4 More genotypes** present in Africa

Source: Magolovkin, A. et al, Comparative Analysis of African Swine Fever Virus Genotypes and Serogroups, Emerging Infectious Diseases, Feb 2015.





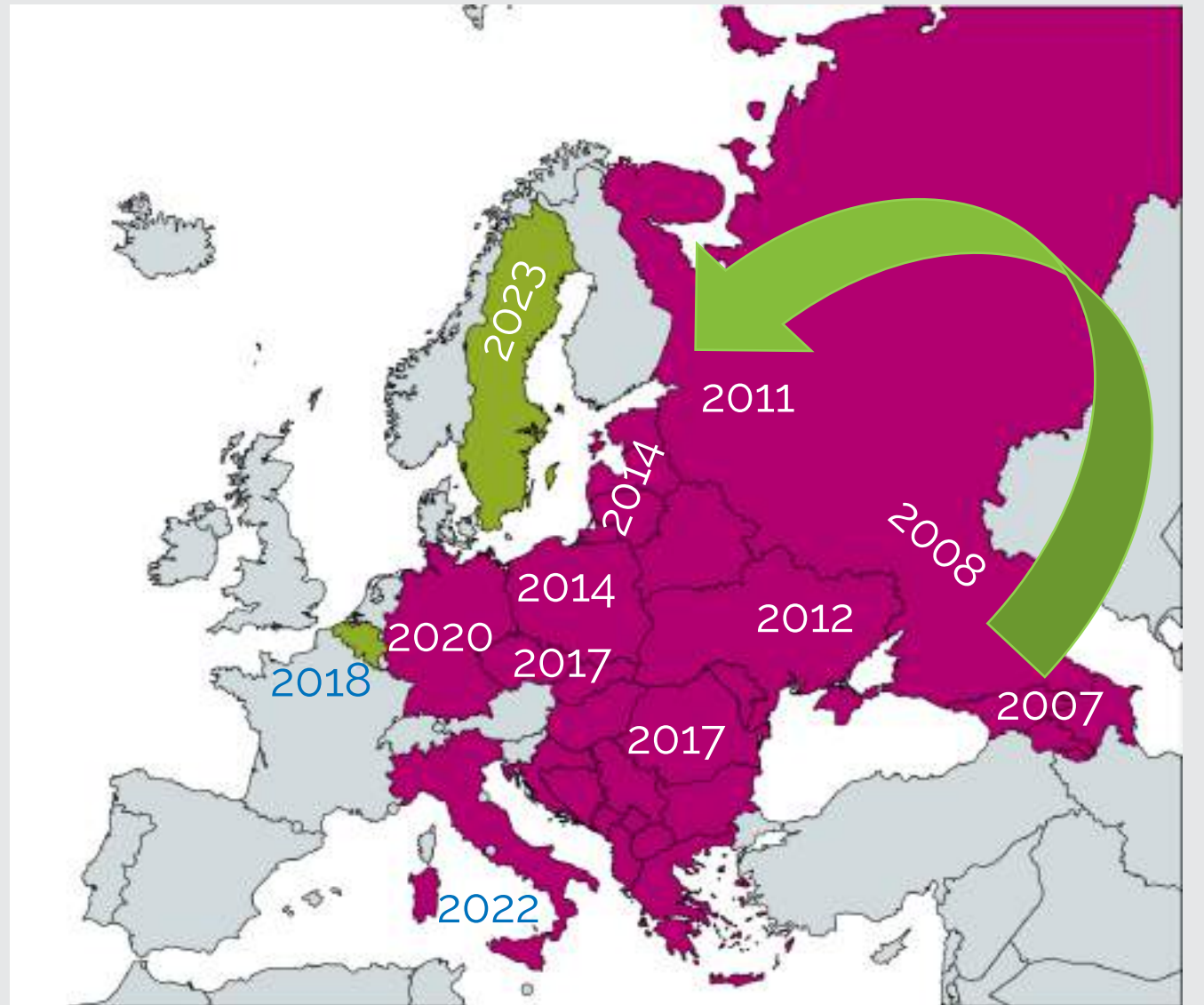
Europe



Europe

- Reported ASF since 2007
- Reported ASF since 2007 – and were declared free

-  **2014** Poland
-  **2017** Romania
-  **2017** Czech Republic
-  **2018** Belgium
-  **2020** Germany
-  **2022** Italy
-  **2023** Sweden





Europe – European Union

- Identification of **infected** zones, high risk & low risk zones
- **Standstill** of pig/feed/meat transport in these zones
- **Culling** of pigs on infected farm
- **Testing** of other farms
- **Ban** on hunting inside infected zones
- **Passive surveillance** to feral pig carcasses in infected zones
- Longer-term: intensive hunting **around** infected zone
- **Regionalisation** takes place for pig/pork trade inside the EU
- **Third** countries close borders





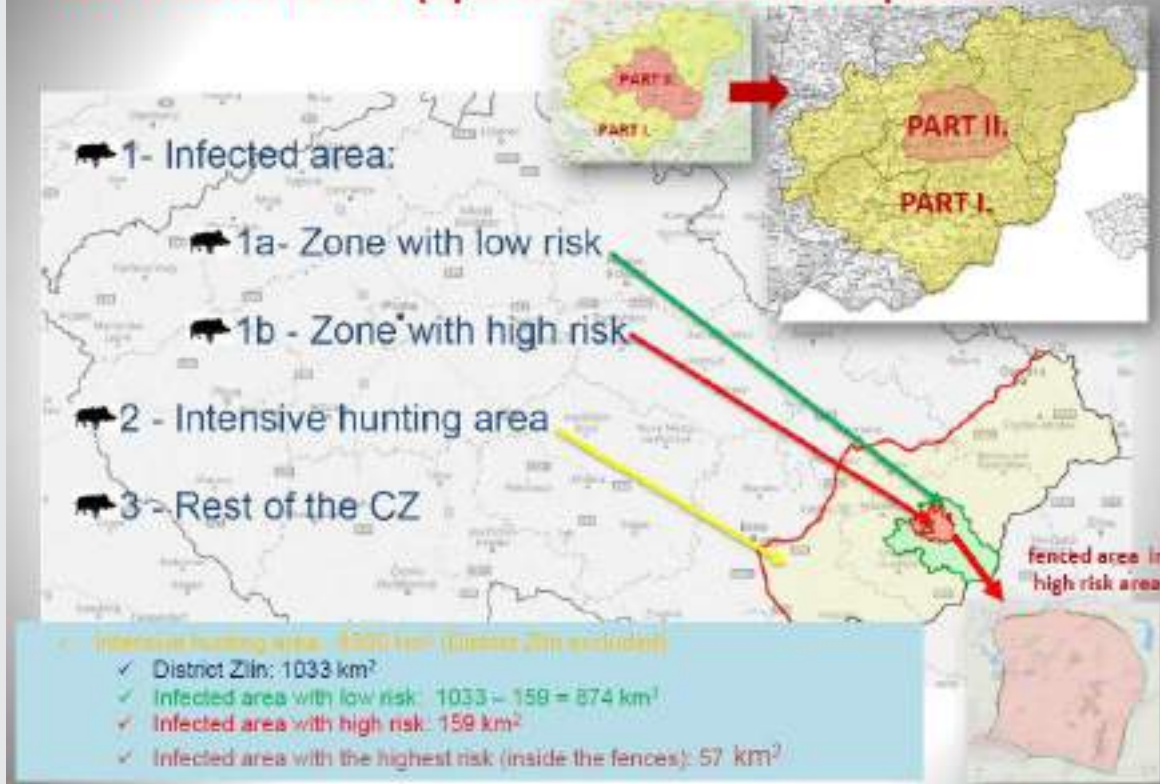
Europe – Czech Republic



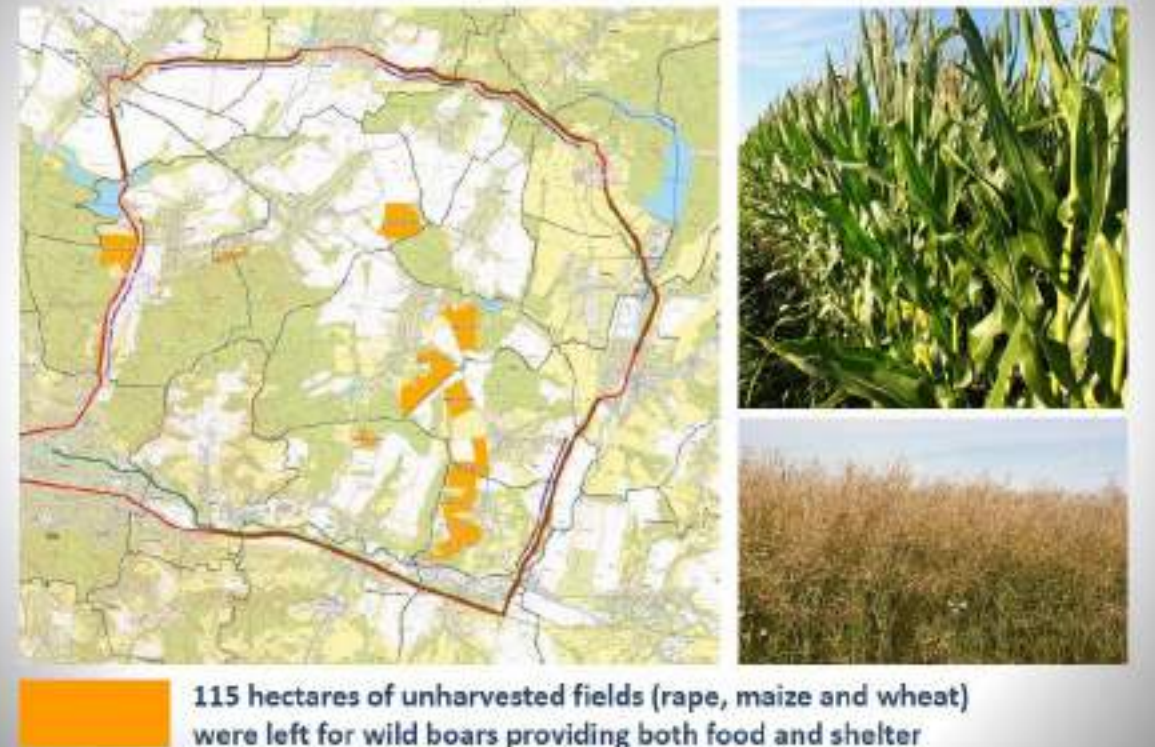
- Virus was around from **June 2017-April 2018**
- Only **feral pigs**, no domestic pigs got infected
- One-off introduction, around city of **Zlín**
- Between **220-230** dead feral pigs were found testing positive for ASF (WOAH/Czech figures); no farms
- **Intelligent** hunting
- Key words: Dedication, focus, **cooperation**, compensation
- Importance of the **human factor**
- In 2022 **return** of ASF

Europe – Czech Republic

ASF measures in 4 (5) levels in the Czech Republic

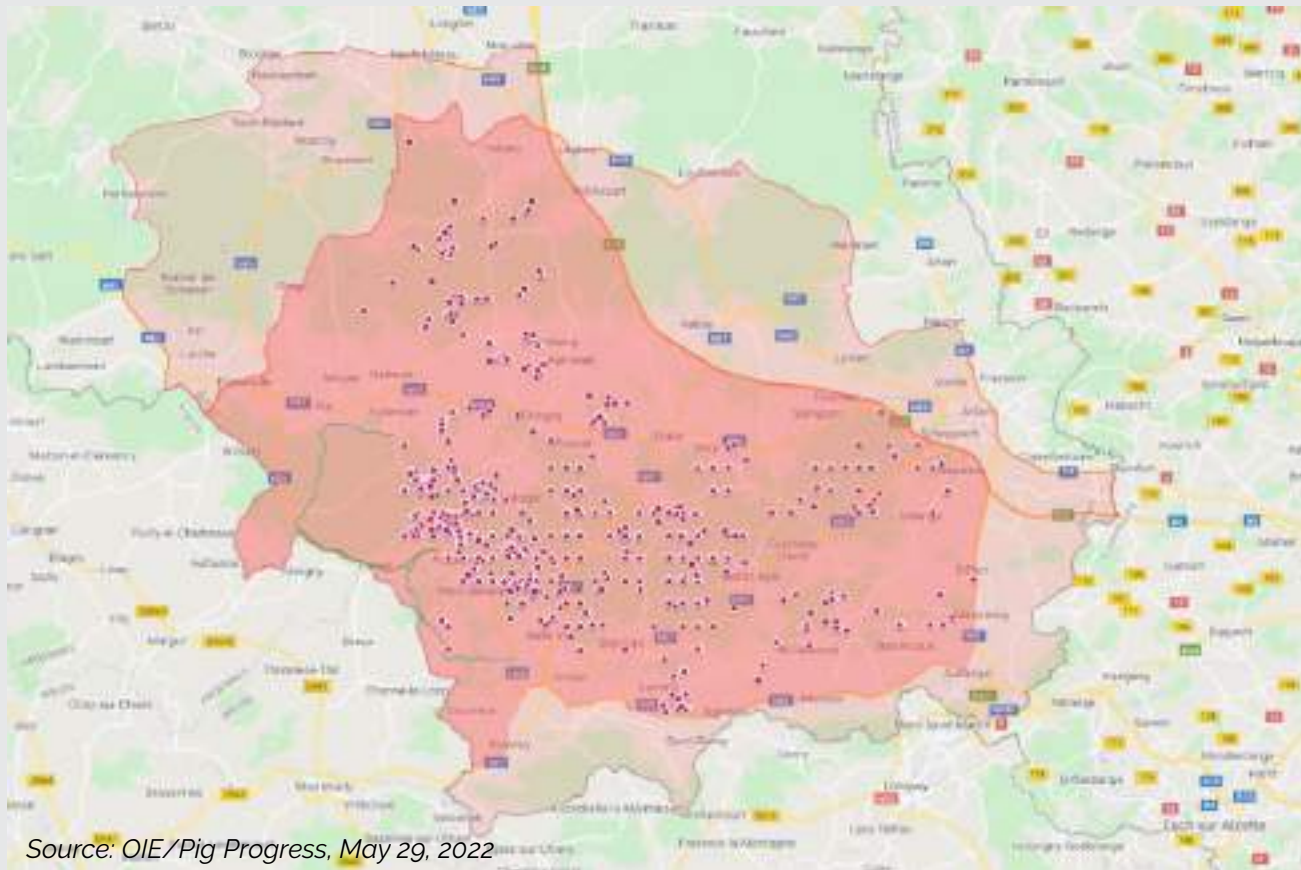


Higher risk area (fenced area) - unharvested fields left



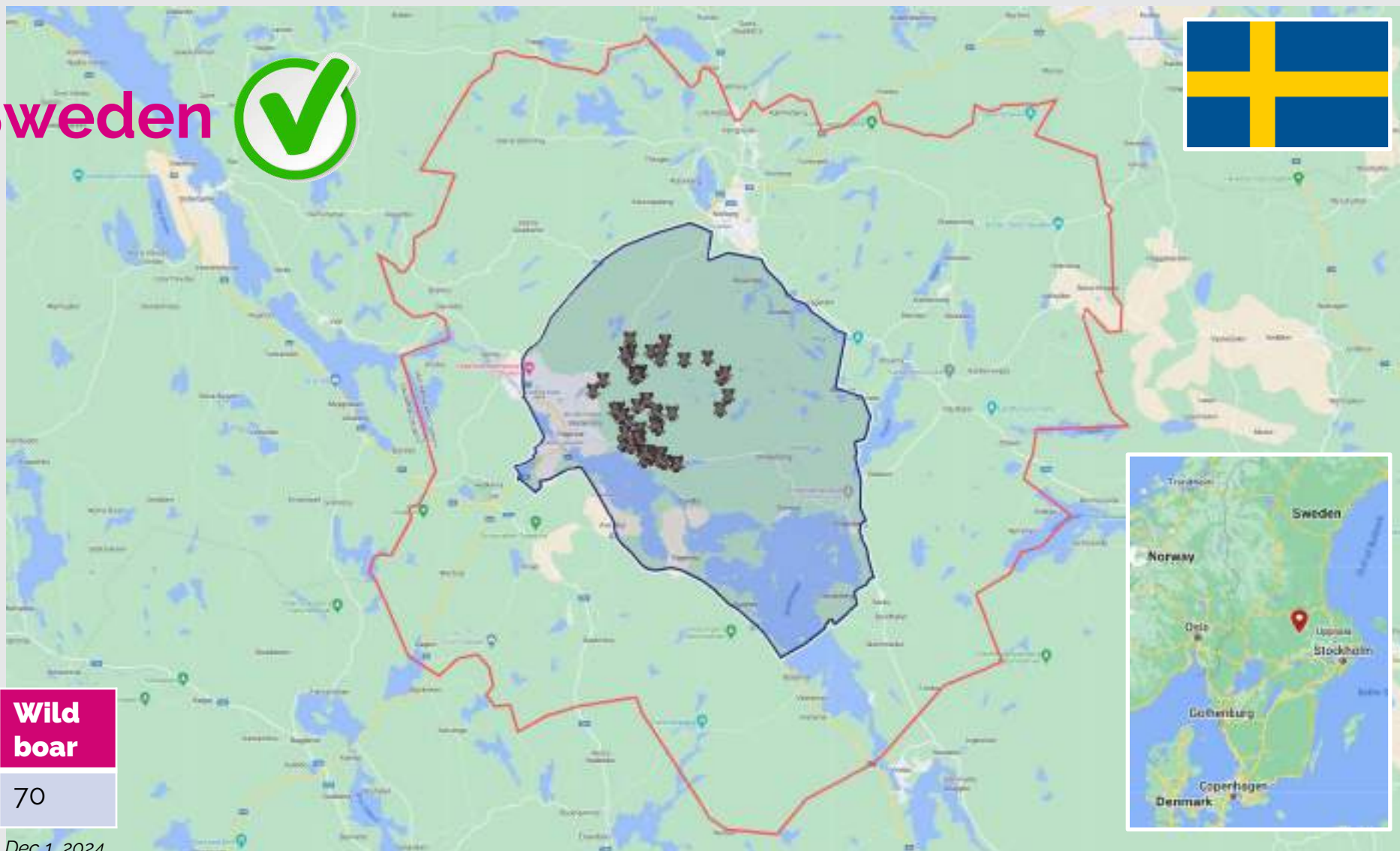
Source: African Swine Fever in wild boar in the Czech Republic (Feb 25, 2019)

Europe – Belgium



- ASFv **present** between September 2018 and March 2020
- Late 2020 declared **free** from ASF
- Only feral pigs (**833**)
- **No farms** - >4,000 pigs culled
- One of two EU countries declared **free** from ASF

Europe - Sweden

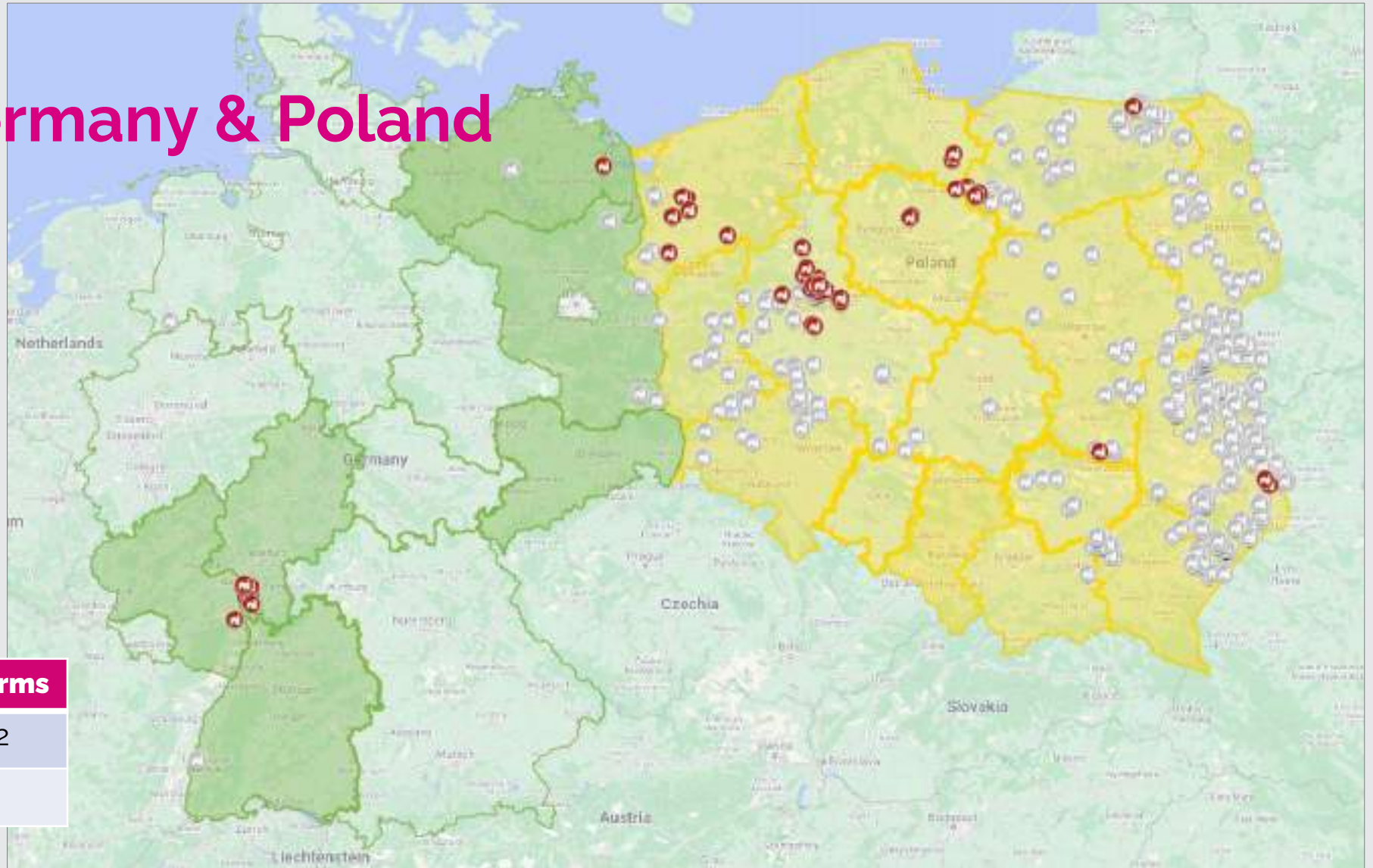


Country	Years	Wild boar
Sweden	2023-2024	70

Sources: Pig Progress, SVA, WOA, Dec 1, 2024.

Europe – Germany & Poland

- Farms infected in 2024
- Farms infected before 2024



Country	Years	Farms
Poland	2014-2024	552
Germany	2020-2024	19

Europe - Germany

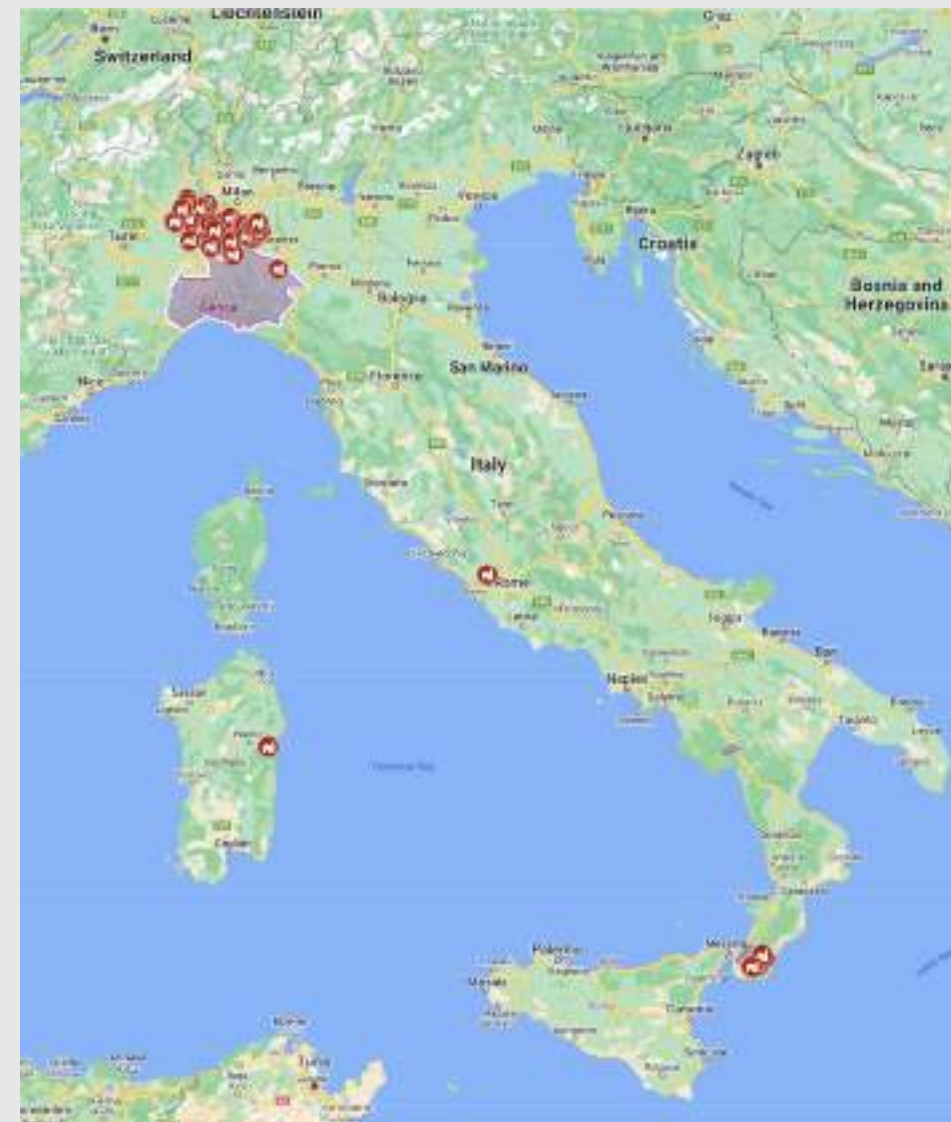


State	Feral pigs	Farms /Zoos
Hesse	483	9
Rhineland-Palatinate	57	1
Baden-Württemberg	1	0

Sources: Pig Progress, WOAH, TSIS, Land Hesse, Top Agrar, Dec 1, 2024.

Europe – Italy (since 2022)

Region	ASF positive feral pigs	Farms infected	Died and culled pigs
Zone Calabria	17	6	559
Zone Campania	73	0	0
Zone Lazio	95	1	9
Zone Sardinia	0	1	13
Zone Northern Italy	2,492	43	127,829
TOTAL	2,677	48	128,410



Source: WOA/IZSUM/Pig Progress, December 8, 2024

Europe – Romania

- Low/no **biosecurity**; backyard farming
- Sows sent into **forest** to mate with feral pigs
- Many (backyard) **farms** infected
- **Corruption**
- **Neighbours** Bulgaria, Hungary, Moldova, Serbia infected
- **€350 million** loss in the 1st year (2017/2018)
- Almost 700,000 pigs had to be culled
- Pork **import levels** from 50% of consumption to 65%
- The **human factor** makes the difference





Europe – Summary

- In **EU**: tendency to report accurately, transparently and swiftly
- In **Eastern Europe**: feral pigs and (backyard) farmers struggle
- **Romania** turned out to be a disaster
- Spread in **Western Europe**: Feral pigs (reservoir, slow spread) in combination with human behaviour (fast spread)
- **Sweden** and **Belgium** show that eradication is impossible
- **Italy** and **Germany** facing tough disease pressure
- In EU: **Vaccination**, once available → used to control ASF in feral pigs

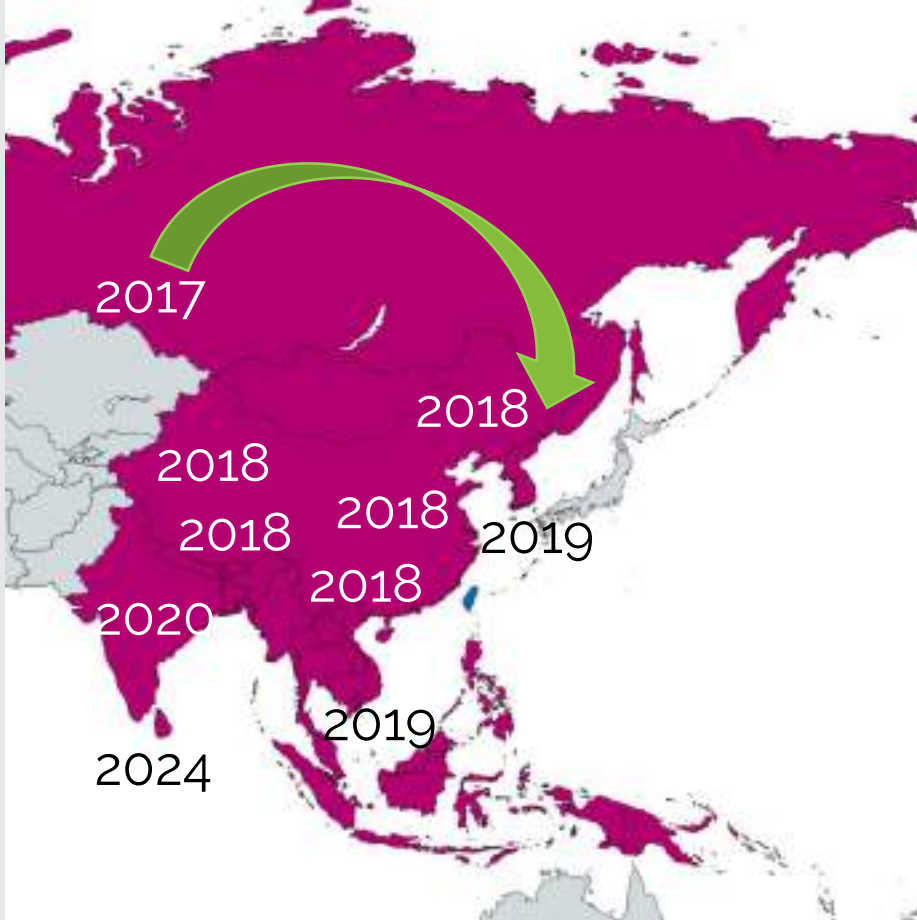


Asia





Asia



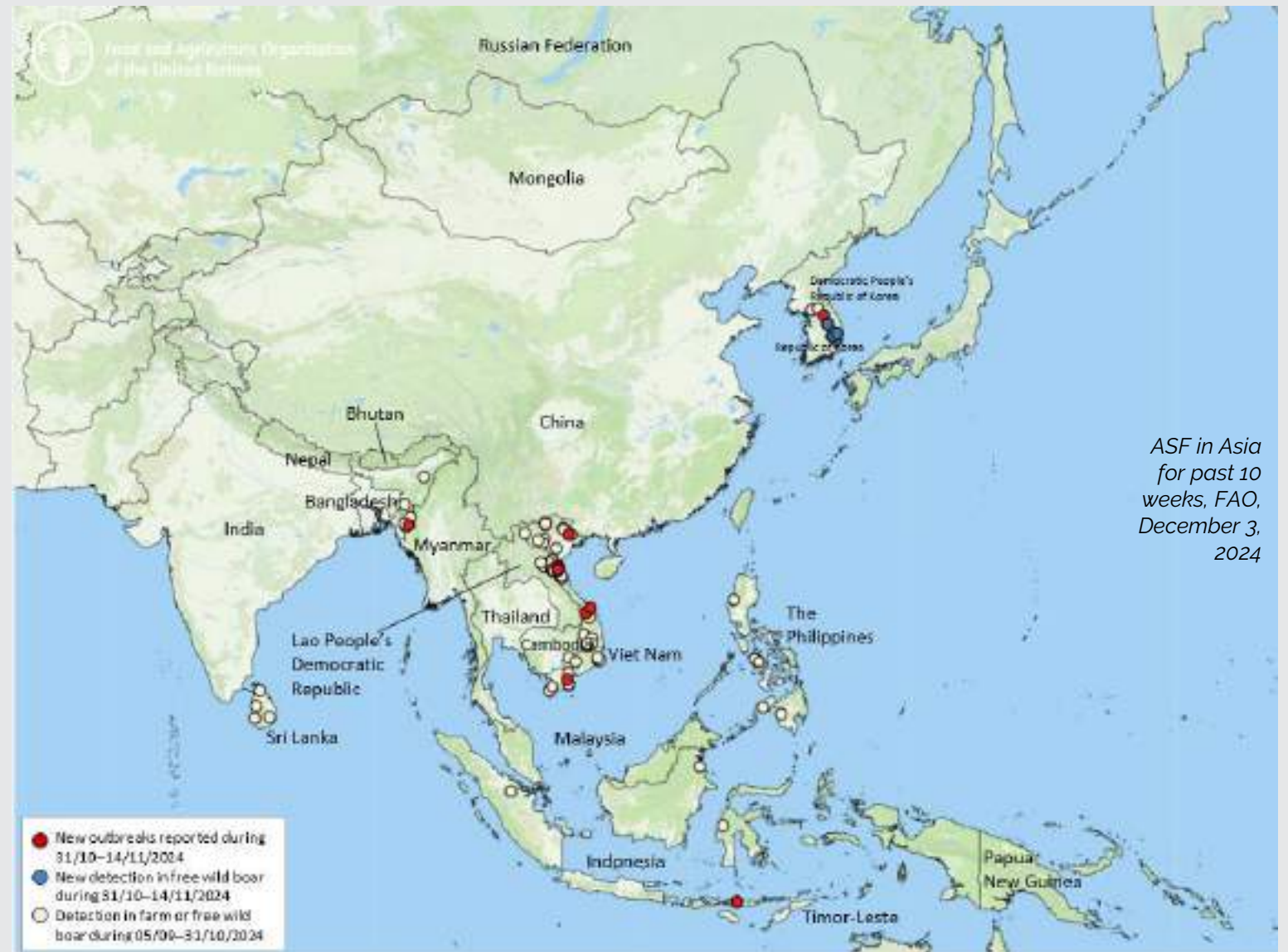
2017 March	Asian Russia
2018 August	China
2018 December	Taiwan*
2019 January	Mongolia
2019 February	Vietnam
2019 March	Cambodia
2019 May	Hong Kong
2019 May	North Korea
2019 June	Laos
2019 July	the Philippines
2019 Augustus	Myanmar
2019 September	Indonesia
2019 September	East Timor
2019 September	South Korea
2020 March	Papua New Guinea
2020 May	India
2021 February	Malaysia
2021 May	Bhutan
2022 January	Thailand**
2022 May	Nepal
2023 May	Singapore
2023 November	Bangladesh
2024 October	Sri Lanka

* Washed ashore;
no official report
to WOAH

** Virus was
probably around
many months
before

Asia – China

- First outbreak in **2018**
- Outbreaks in **all provinces**
- Total herd (2017):
441.6 million (FAO)
- Total herd (2018):
428.2 million (FAO)
- Total herd (2019):
310.4 million (FAO) (-30%)
- Total herd (2020):
406.5 million (FAO)
- **206** outbreaks officially reported (MARA/WOAH)
- Severe **underreporting**



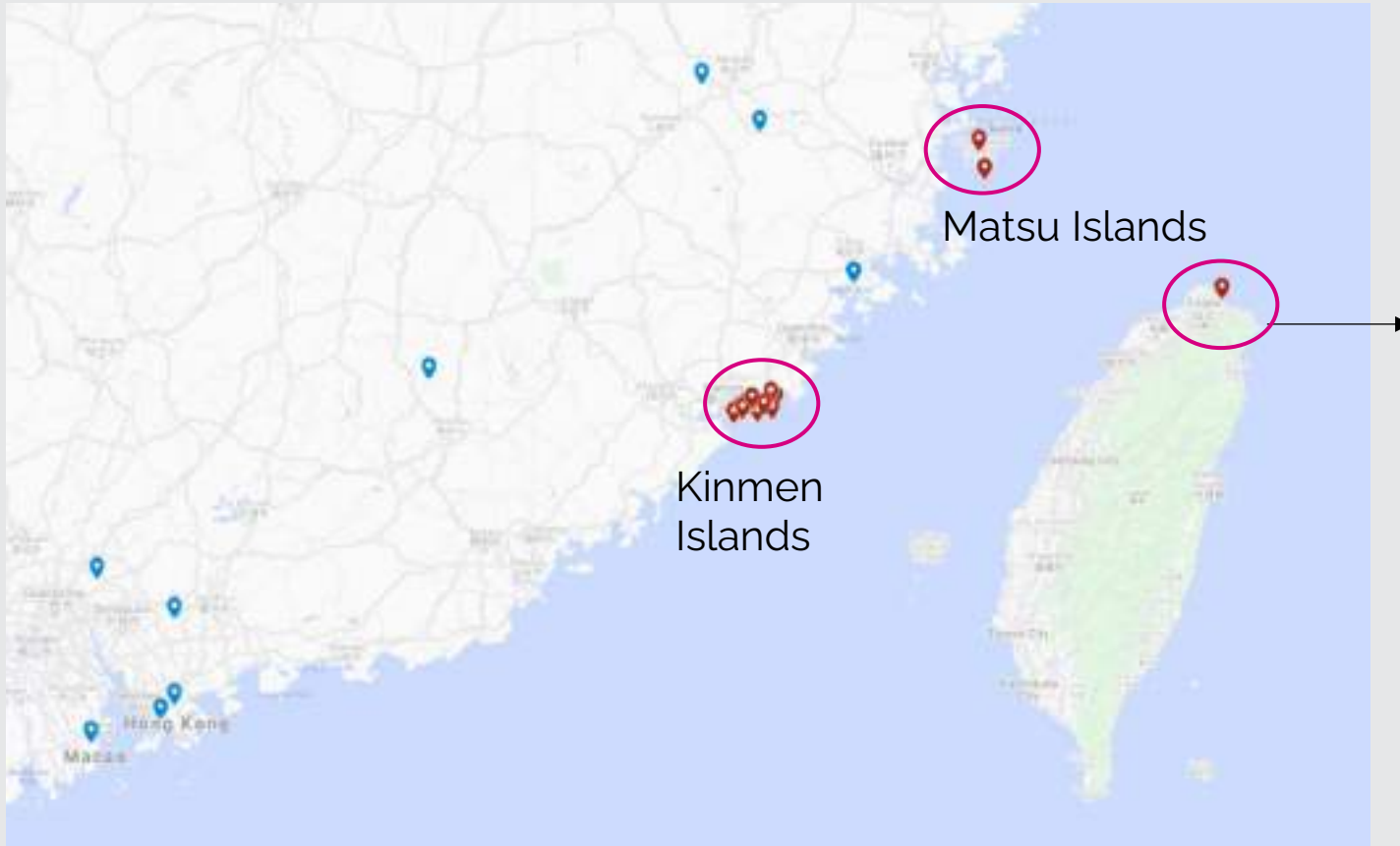
*ASF in Asia
for past 10
weeks, FAO,
December 3,
2024*

Asia – China

- Serious **money**
- Fast recovery – **high-rise** buildings
- Attempts to create an ASF vaccine (**Harbin** Veterinary Research Institute)
- Bootleg use of **illegal vaccines** → Mutation enters Chinese herd → “PRRS-like viral reproductive syndrome”
- **Genotype I** also found (Shandong and Henan provinces)
- Highly lethal genotype I and II **recombinant** ASF viruses



Asia – Taiwan



Source: COA/Pig Progress, May 30, 2022



- **No ASF** on farms or in live pigs
- 16 pigs **washed ashore**, 2018-2022
- Found April 2021 – **how?**
- China: **1 outbreak** reported in 2022
- Proves severe **underreporting**

Asia – Vietnam

- First outbreaks in **2018**
- All **63** provinces infected in 2022 (FAO)
- Total herd (2018): **28.2 million** (FAO)
- Total herd (2019): **19.6 million** (FAO) → -30%
- Total herd (2020): **22.0 million** (FAO)
- Total herd (2021): **28.0 million** (MARD)
- Outbreaks still being **reported**
- **Rebuilding** the pig industry fast
- Most activity with **vaccination**

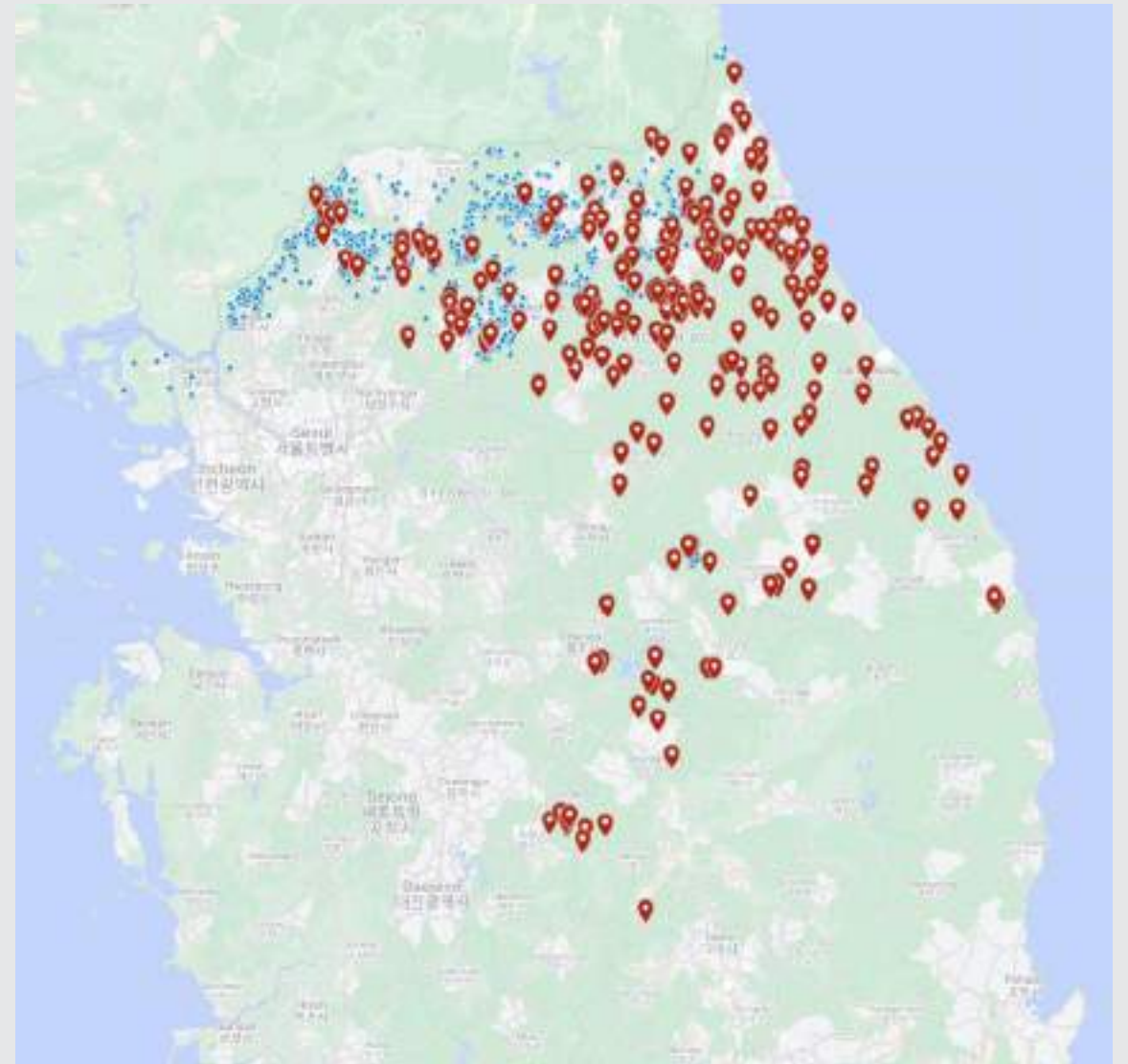
Source: WOAHO/OIE,
Pig Progress, July 17, 2022



Asia – South Korea

- Reported May 2021-July 2022
- Reported 2018-2021

- **4,179** feral pigs infected (FAO, Nov 13, 2024)
- **48** farms
- Very **detailed** information
- **North Korea**: 1 village (May 2019)

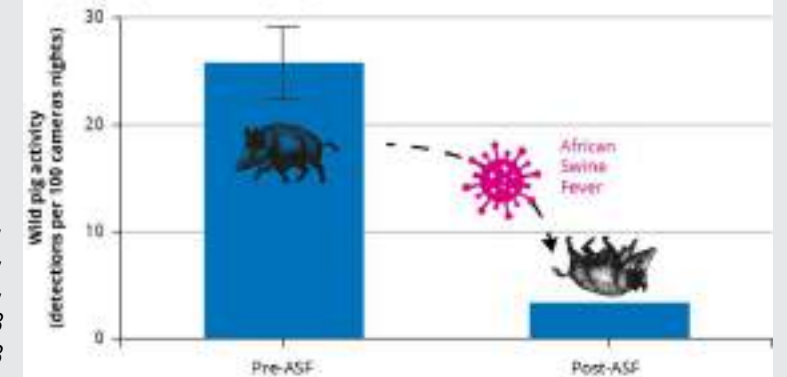


Source: OIE/Pig Progress, July 17, 2022

Asia – Malaysia



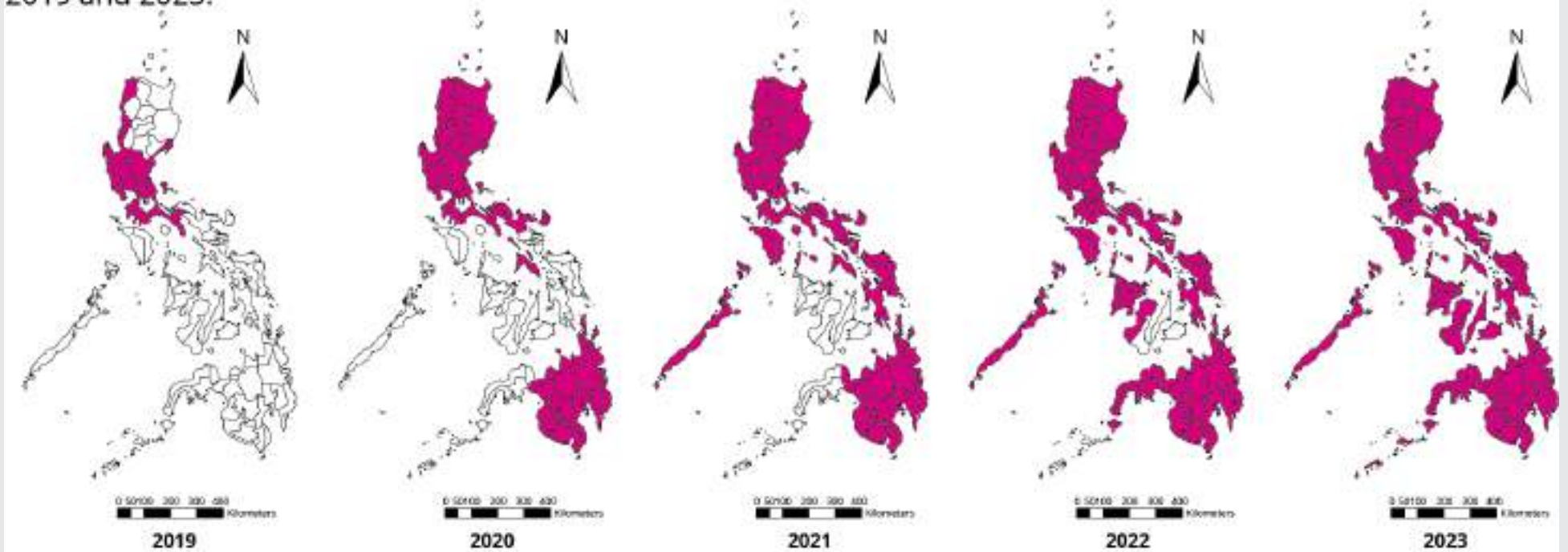
Figure 1 – Activity levels of native wild boar at the Pasho landscape before ASF (2013–2019, "pre-ASF") compared to during the initial ASF onslaught in 2022 (post-ASF). The units for the relative activity index are independent captures per 100 trap nights.



Source: Matthew S. Lusk,
University of Queensland,
Australia,
Wildlife Letters, 2023
and *Pig Progress*, 39.07, 2023

Asia – the Philippines

Figure 3 – Cumulative number of ASF outbreaks reported per region and per province in the Philippines between 2019 and 2023.



Year	2019	2020	2021	2022	2023
Cumulative affected regions	3	10	12	15	17
Cumulative affected provinces	6	36	50	59	72

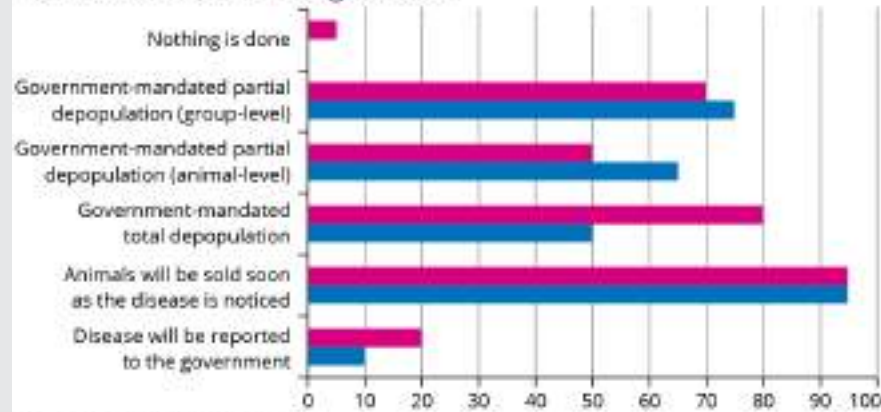
Source: Dr Jesper Chia-Hui Hsu,
University of Minnesota,
Veterinary Science 2024

Asia – the Philippines

- **19,697** farm outbreaks studied
- **Monsoon** – humidity, rainfall, floodings
- **Human** activity

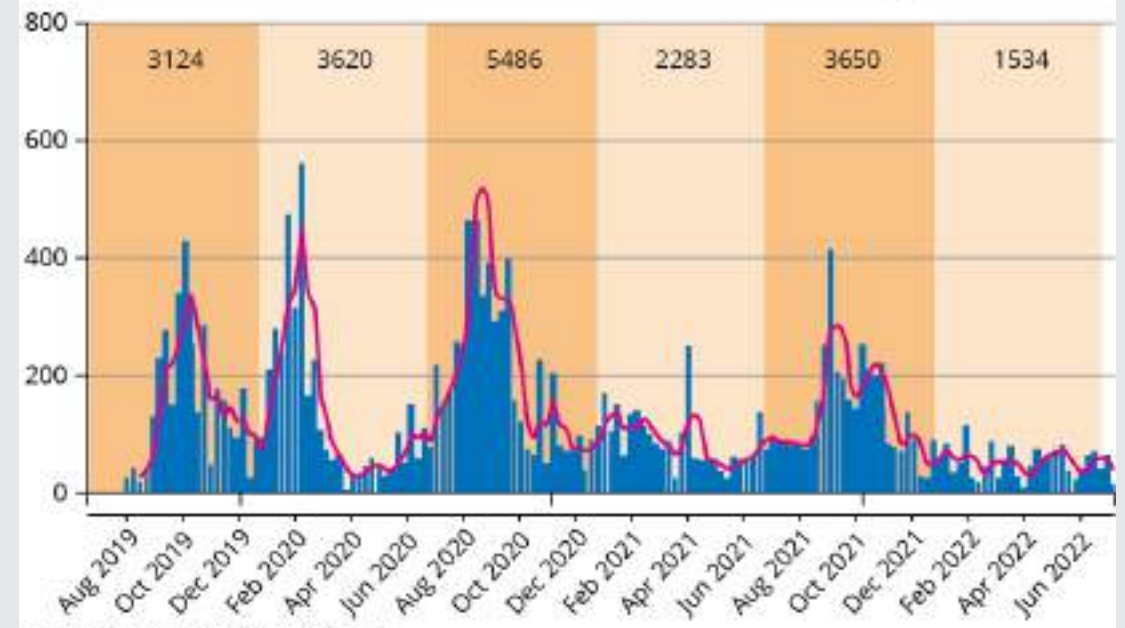
Source: Dr Jesper Chia-Hui Hsu,
University of Minnesota,
Pig Progress 40.07, 2024

Figure 2 – Estimated control actions by commercial and backyard producers in the Philippines following an on-farm ASF detection, according to vets.



Source: Hsu et al., Pathogens, 2023.

Figure 1 – Weekly number of African Swine Fever (ASF) outbreaks and three-week moving average reported in the Philippines between 16 August 2019 and 20 July 2022. The numbers on top indicate the cumulative number of outbreaks on the first and second semester of the year.



Source: Hsu et al., Microorganisms, 2023.



Asia – Conclusion

- **Complex problem** of large farms, subsistence farms, feral pigs
- **Quick** spread was due to
 - Human behaviour
 - Relative high amount of backyard farming
 - Low biosecurity levels
 - Insufficient central coordination
 - Underreporting
 - Climate situation
 - Relatively poor veterinary infrastructure
- Rapid **reconstruction** of the swine herd
- Accelerated **professionalisation** of the industry
- ASF situation is likely to become **endemic**
- Prospects for **vaccination** (China, Vietnam, Philippines)



Americas



Americas



Source: OIE/Pig Progress, July 16, 2022

Americas – Dominican Republic

- Number of **producers** (pre-ASF): 25,000
- Industry **size** (pre-ASF): 1.8 million head
- Industry **value** (pre-ASF): US\$700 million
- **Backyard** percentage (pre-ASF): 35% of producers
- Date of ASF **entrance**: July 1, 2021
- Number of **provinces** infected: 29 out of 32
- Outbreak **locations** documented: ~1,000 (March 2022)
- **Cull numbers** due to ASF: 180,000 pigs (March 2022)
- **Reduction** of the pig herd: 25% (est.)
- **Compensation** paid: >US\$22 million (March 2022)
- **Inconsistent** infection pattern (USDA-ARS)



Dr Francisco Israel Brito,
president, Dominican
Federation of Pig Producers



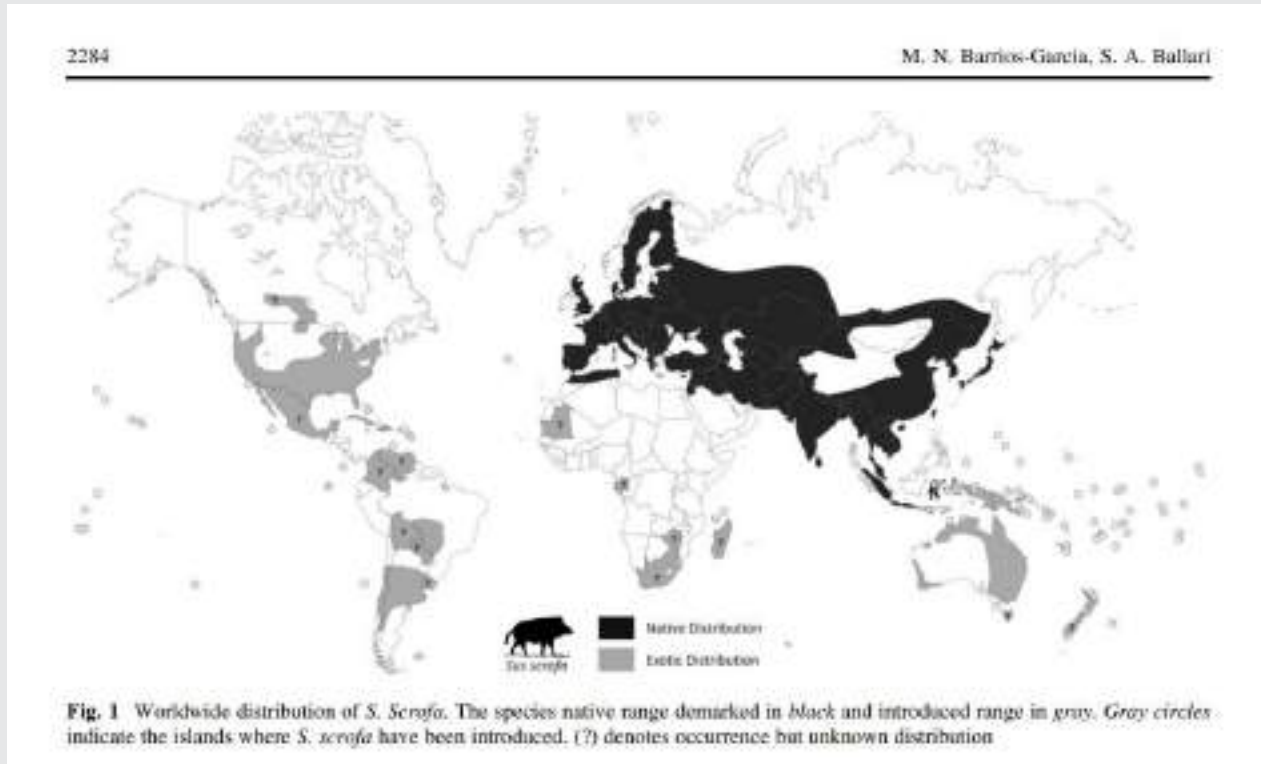
Prof Joaquín Paulino,
Agricultural University ISA

Americas – Haiti

- **Departments** reported infected: 8/10
- **Outbreaks** reported: 31
- **Pigs** reported infected: 3,077
- **Last** reported infection: March 12, 2022



Americas – route of infection?



M.N. Barrios-García, and S.A. Ballari, S.A., *Impact of wild boar (Sus scrofa) in its introduced and native range: a review. Biological Invasions, 2012.*



J. Alfonso Ortega-S et al, *Wild Pigs in Mexico and the Caribbean*, in book: *Invasive Wild Pigs in North America*, February 2020.

Americas – History





Americas – History



Source: Museo de la Revolución, Havana, Cuba



Source: Dr Tânia Rosária Pereira Freitas.



A cure?



Vaccine companies – Vietnam

- **AVAC** (Hanoi) → AVAC ASF Live
 - Based on ASFV-G- Δ MGF strain
 - Attenuated live vaccine for Vietnam, Philippines
 - One shot, 4 weeks of age and older
 - Working together with Aptimmune
- **Navetco** (Ho Chi Minh City) → Navet-ASFvac
 - Based on ASFV-G- Δ I177L strain
 - On the market in Vietnam, for pigs > 8 weeks
 - Working together with USDA-ARS
- **Dabaco** (Hanoi) → Dacovac ASF2
 - Based on ASFV-G- Δ I177L/ Δ LVR strain
 - For pigs > 4 weeks
 - Working together with USDA-ARS
- **Many more initiatives...**
- **Europe:** Mostly for feral pigs



The feed route

- Feed **biosecurity**
- Feed **heat** treatment
- **Ultraviolet** treatment
- Feed **additives** (e.g. aqueous formaldehyde, MC/SC fatty acids, essential oils)
- **Acidifiers** with antiviral properties
- **Oronasal** vaccines in bait (for wild boar)
- Spray-dried **plasma** (APC) → *Vaccines* (2023)
- **Immune booster** complex (Innovad) → IPVS Congress 2024

Using vaccination and plasma to fight ASF virus



Source: Pig Progress
August 2023

Immune booster observed to delay onset of ASF



Source: Pig Progress
June 2024



eonclusion





Poll question

How often has ASF virus successfully crossed the Atlantic?

- Once
- Twice
- Three times
- Four times



Key take-aways

- No country is **immune** to ASF
- Virus needs a biological **reservoir**: pigs, feral pigs or soft ticks
- Virus can spread by **fomites**: boots, meat, feed, insects
- Human behaviour key to both **spread** and **control**
- For developed swine industry: Outbreak in **domestic pigs** is relatively easy to control
- Outbreak in **feral pigs** is hard work
- **Vaccination** offers promises in developing countries

Questions & contact details

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