



National Bee Diagnostic Centre
Technology Access Centre

National Honey Bee Health Survey: 2014-2017



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National Bee Diagnostic Centre /AAFC



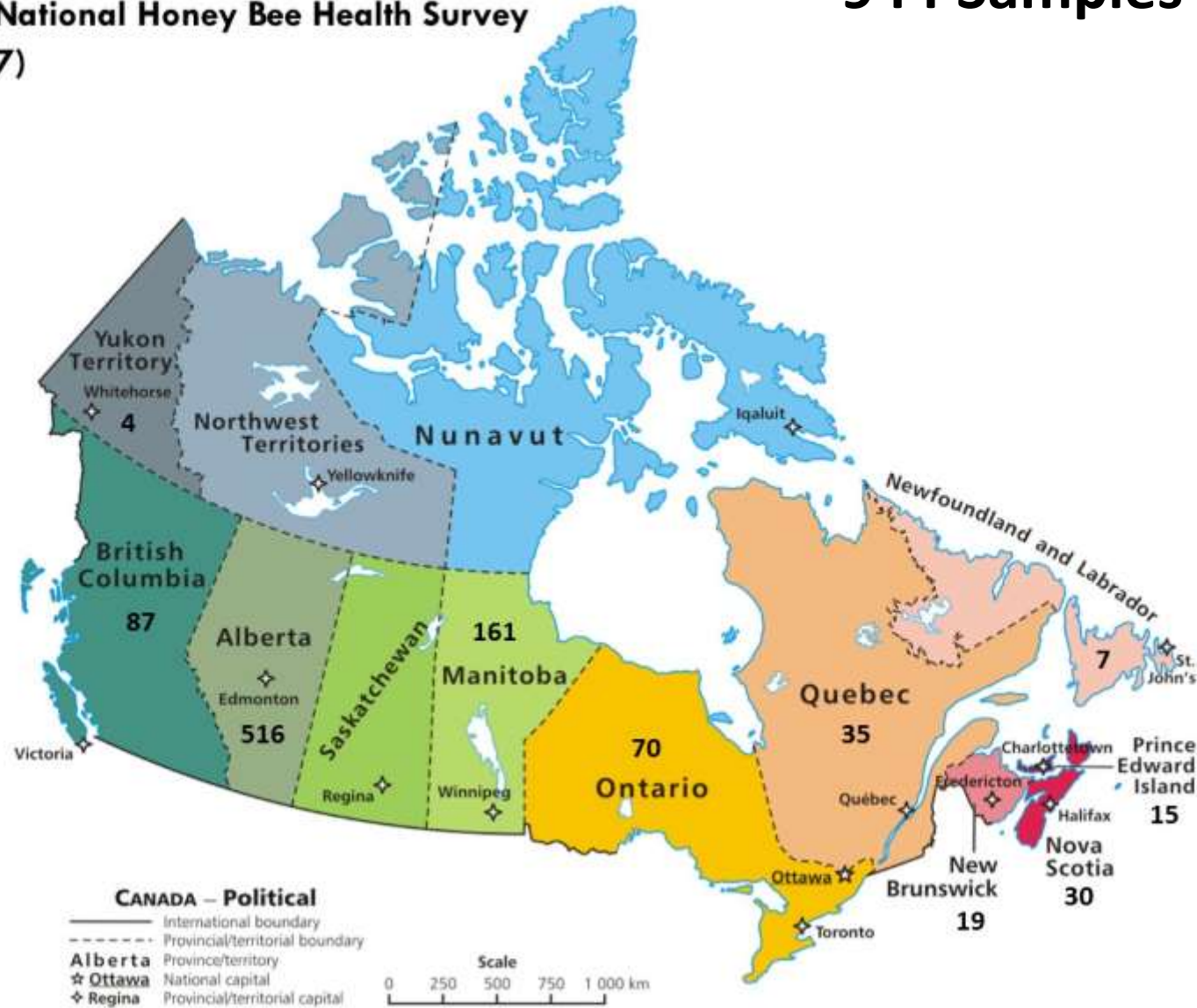
Survey overview

- **Goal:** Determine the incidence and distribution of pests, pathogens and parasites affecting honey bees and establish the presence or absence of exotic threats to the beekeeping industry.
- **Target:** 0.5% of all registered colonies. In proportion to distribution and density of colonies within province.
- **Field Inspections**
- **Laboratory test**
 - I. Nosema
 - II. Varroa
 - III. Tracheal mites
 - IV. AFB and EFB
 - V. 8 viruses
 - VI. Neonicotinoids
 - VII. Exotic Threats



**Number of Samples Collected for the
Canadian National Honey Bee Health Survey
(2014-2017)**

944 Samples Total



Acknowledgements: Technicians



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Greg Hawkins (ON)



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(Maritimes)



Cameron Menzies
(Maritimes)



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Terry Fehr (MB)



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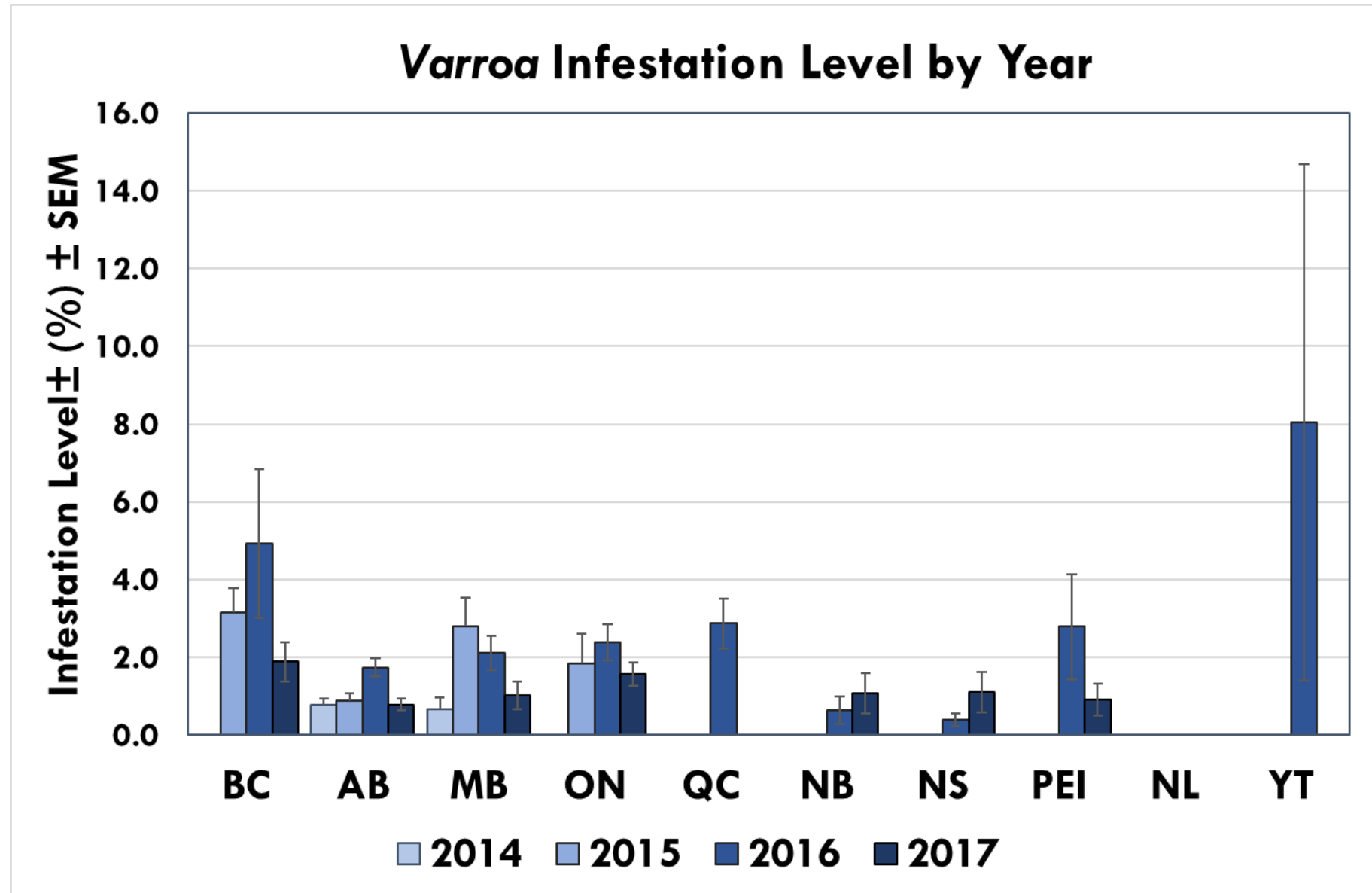


Elena Battle

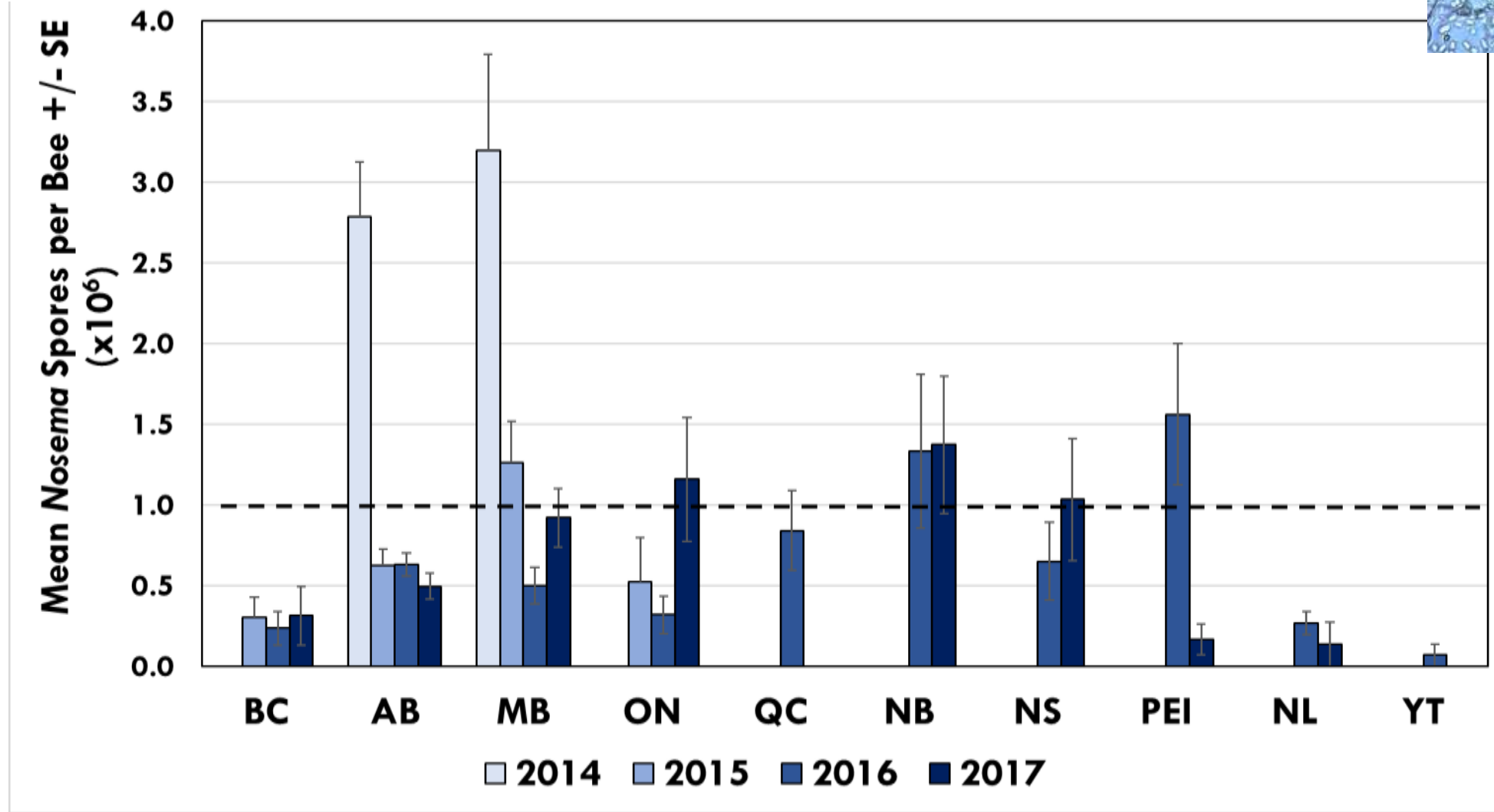
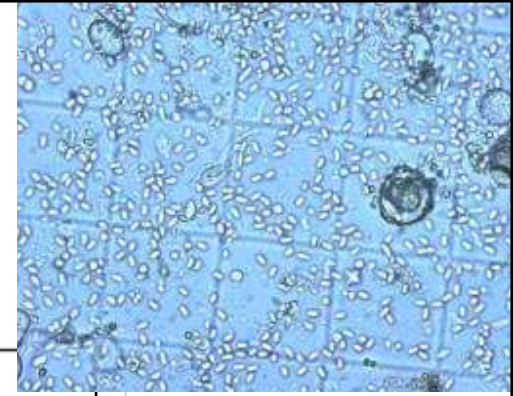
*Not pictured, Ron Anderson



varroa

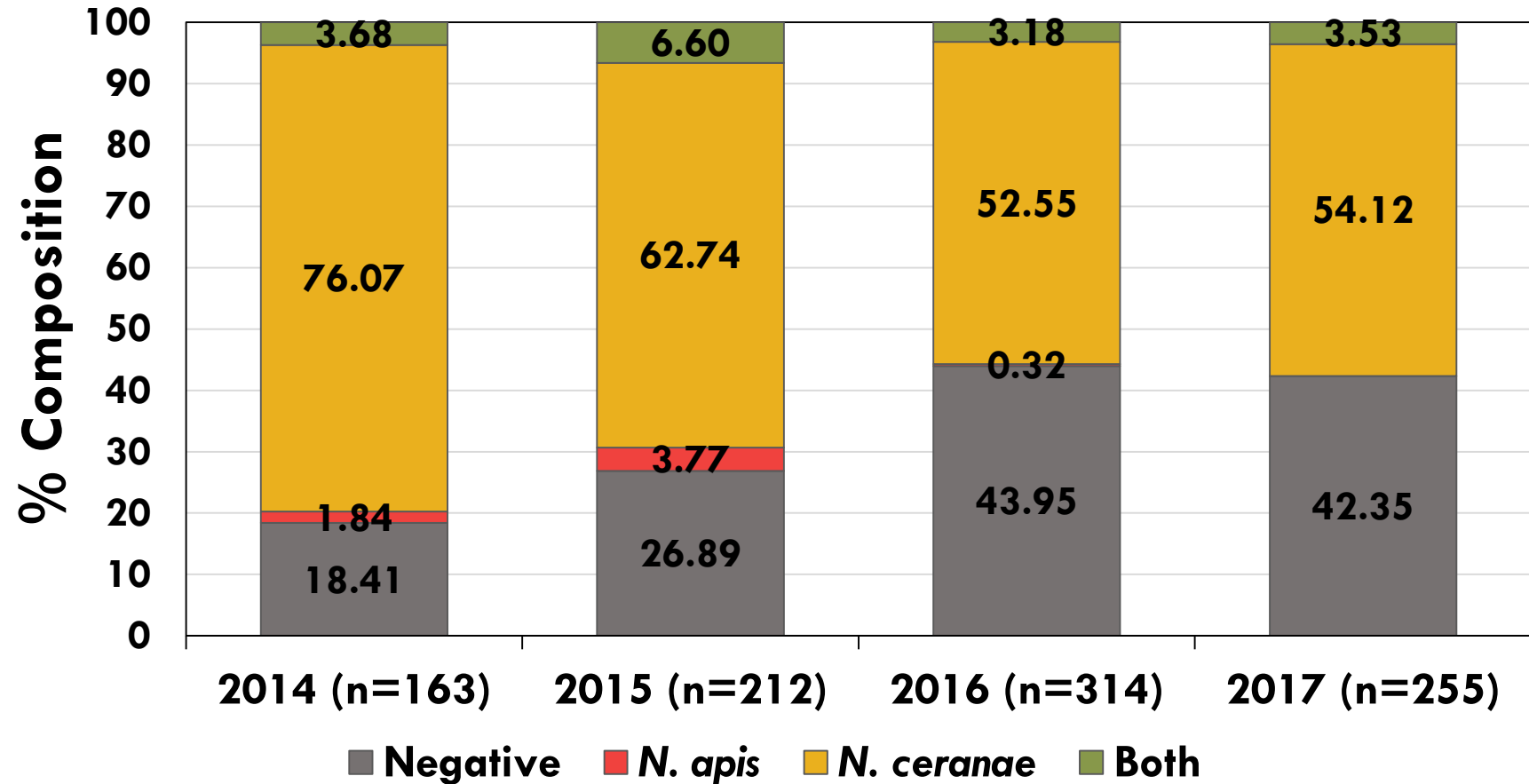


Nosema



Nosema

Nosema spp. Composition per Year

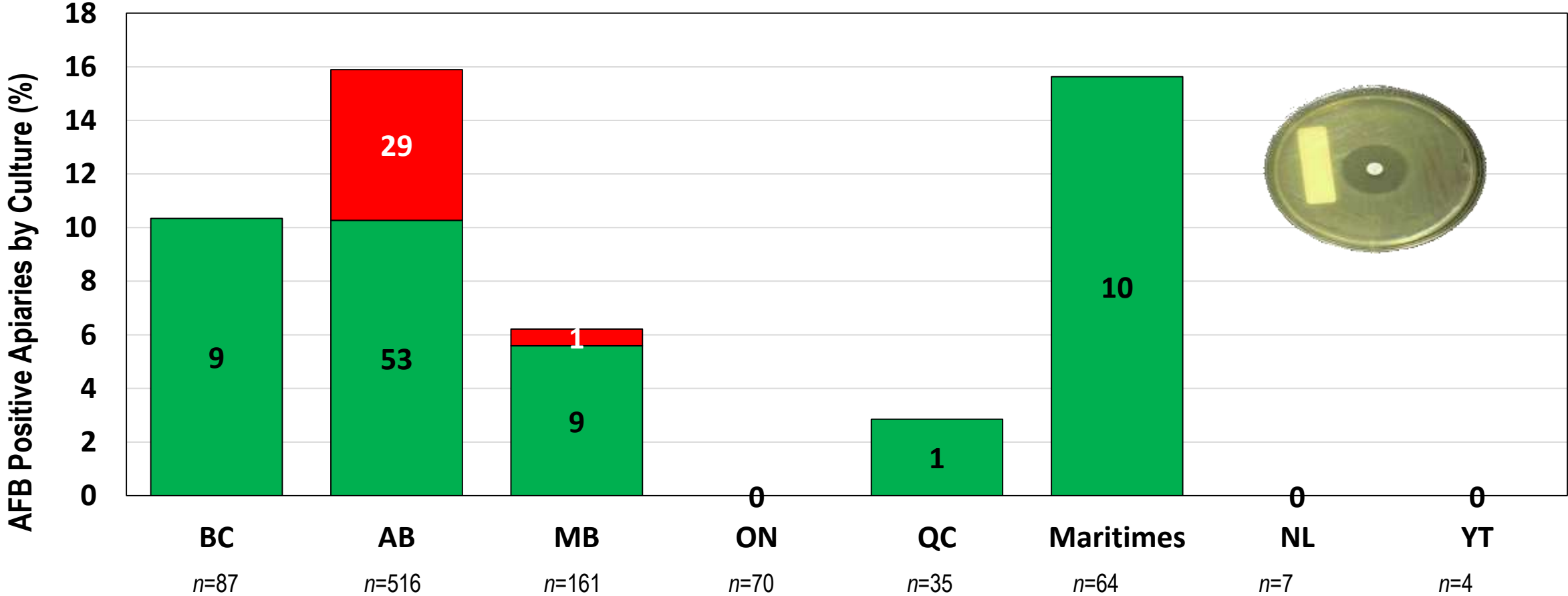


- *Nosema ceranae* the most prevalent species
- Single infections of *Nosema apis* becoming rare

AFB Prevalence / Resistance by Province – 2014 - 2017



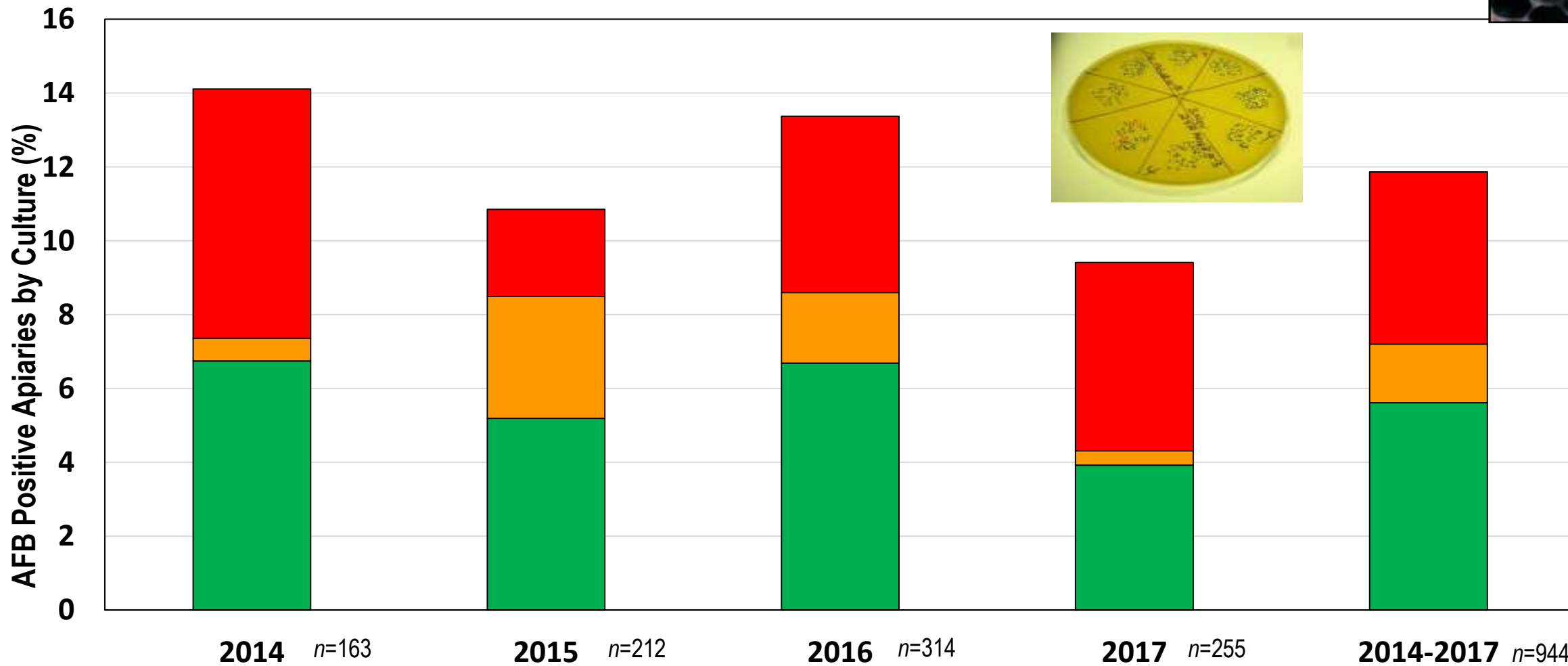
■ OTC Sensitive ■ OTC Resistant



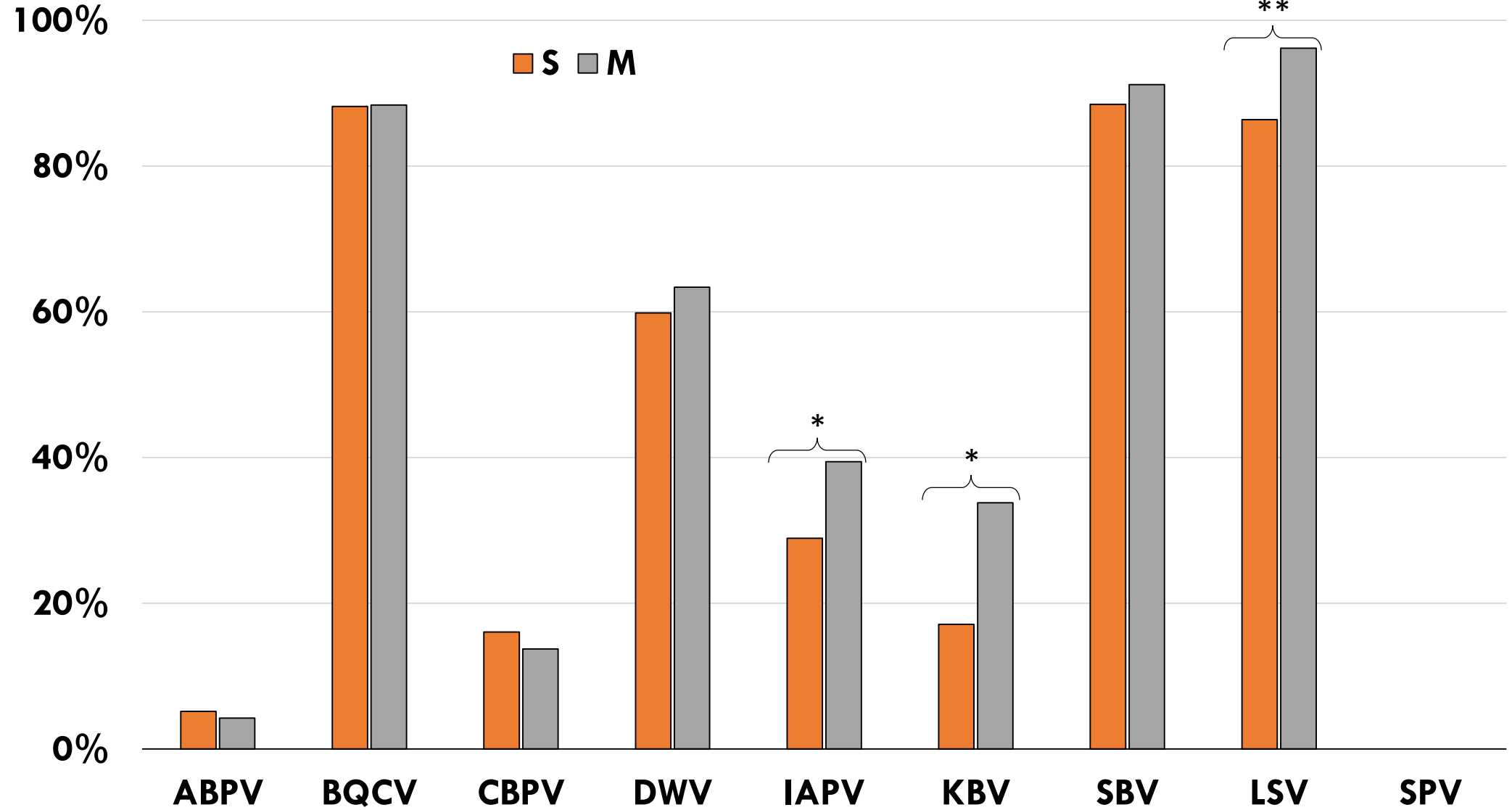
Apiary Level AFB Risk in Canada: 2014 - 2017



■ Possible Risk (0-99 CFU) ■ Moderate Risk (100-999) ■ High Risk (>1000 CFU)



Stationary vs Migratory Viral Prevalence



*= $P < 0.05$, **= $P < 0.0001$

Exotic threats

- Exotic parasite: *Tropilaelaps*
- Exotic pest: *Apis cerana*
- Exotic virus: Slow Bee Paralysis Virus

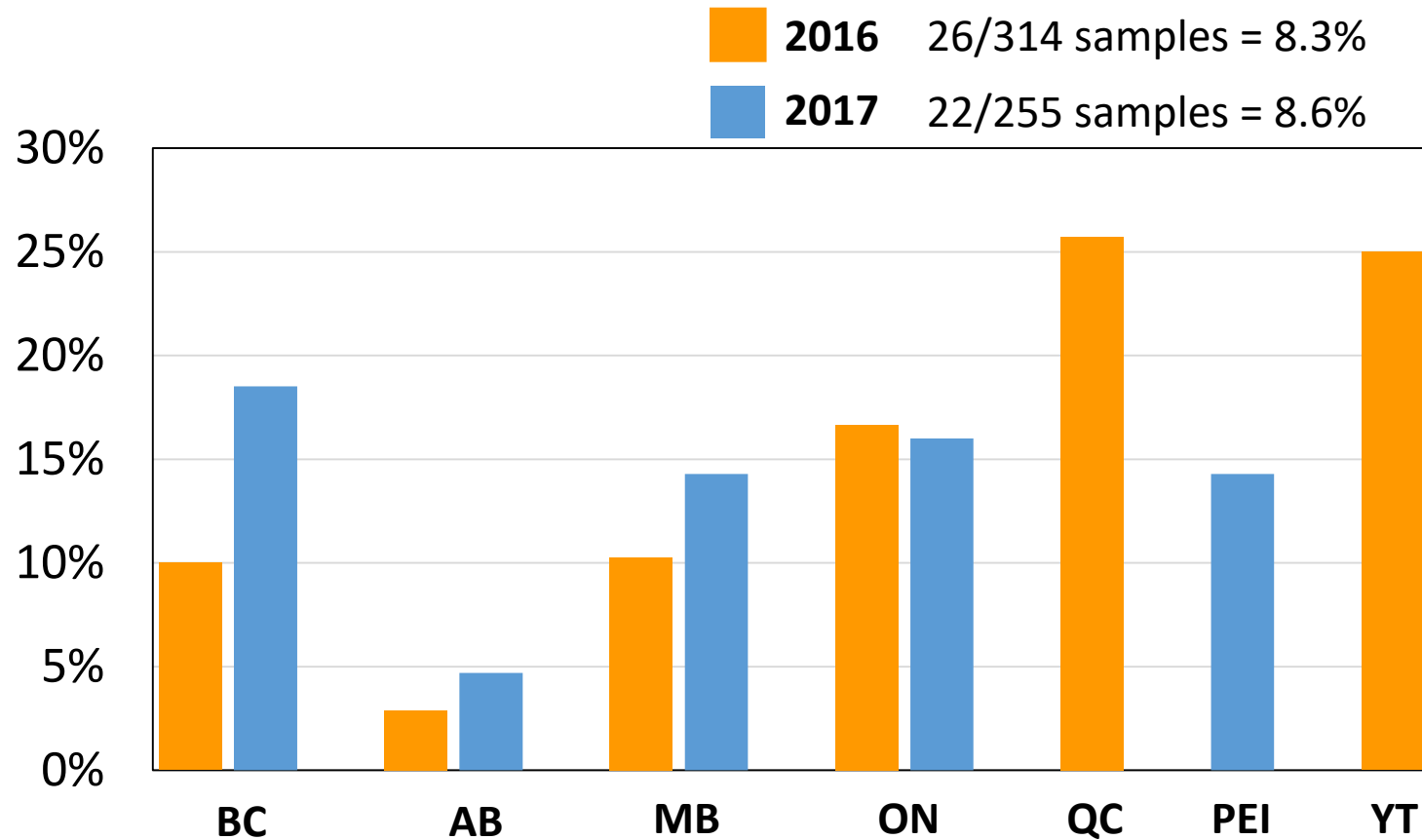
} Not Detected



Photo credit: Pest and Diseases Image Library, Bugwood.org

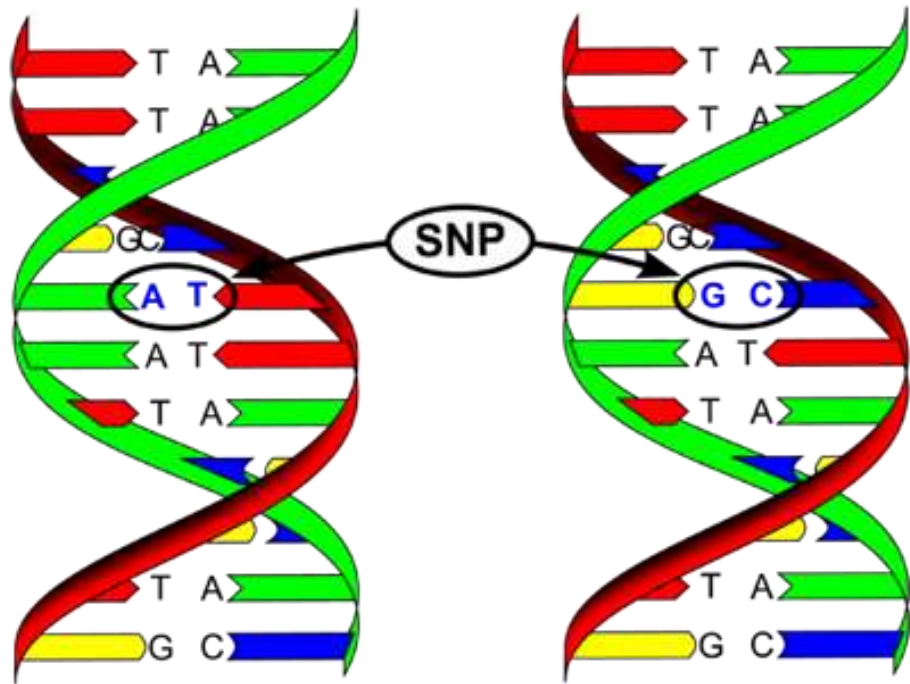
*These results provide empirical evidence to support Canada's zoosanitary status for the trade of bees with other countries

African origin – by mtDNA



* Tested by the method recognized by CFIA to certify queen exports from the U.S.

African origin – by SNPs (Genomic DNA)

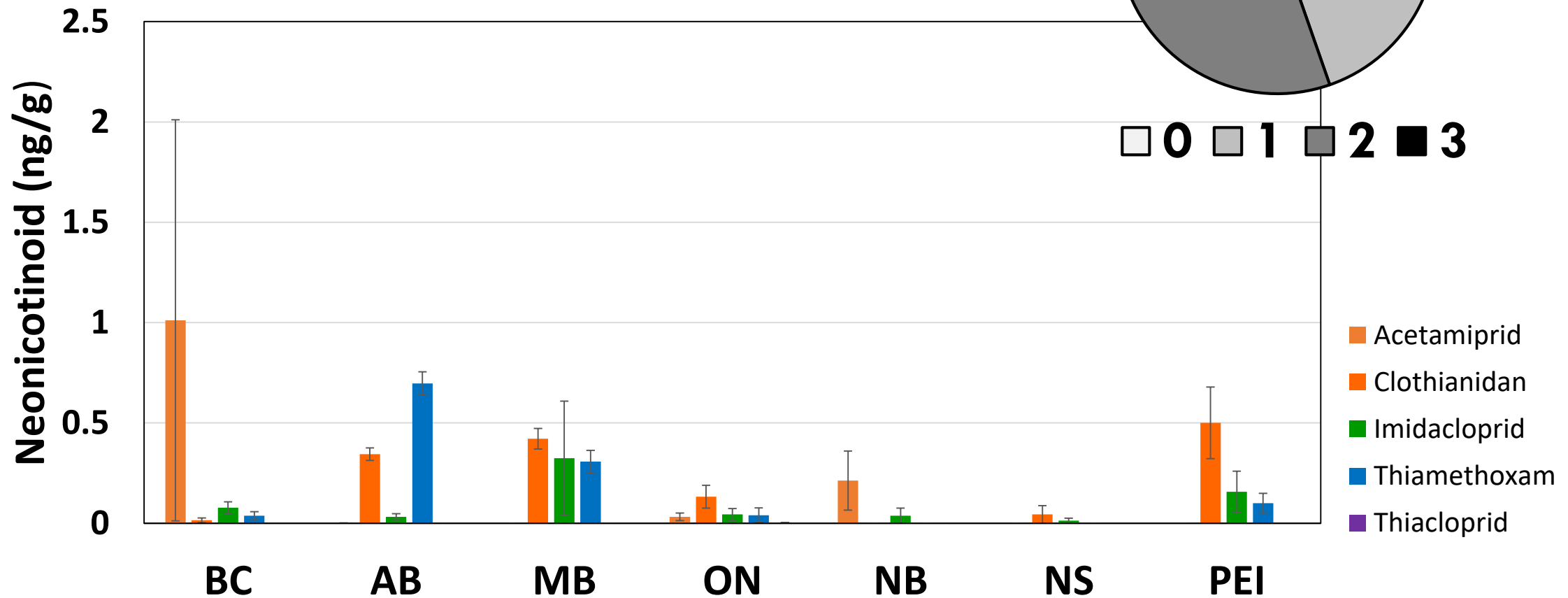
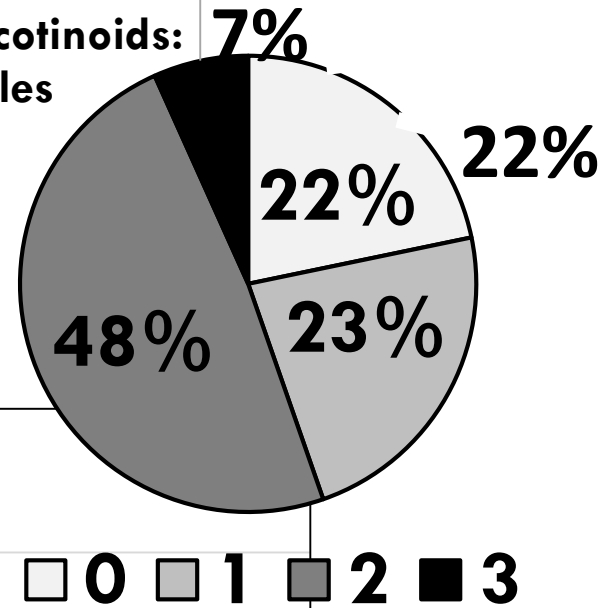


- 2016 samples ranged from 0.6 to 15.9%
- 2017 samples ranged from 0% to 11.5%

**All samples were below 25%
Threshold be considered Africanized**

Chemical residue

Number of Neonicotinoids:
2017 Samples



• On average, these levels are below those normally associated with sub-lethal effects on honey bees

National Survey Phase 2 (2019-2022) - Proposal

- 4 years project:
 - a. 350 samples National Survey
 - 10 provinces
 - a. 150 Samples Temporal Study
 - 4 times per year
 - a. Exotic threats
 - a. Outbreaks and Emergent



Photo Credit: Christy Curran





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Questions and Comments