

Arbovirus surveillance programme

Introduction

The arbovirus surveillance programme was instigated in 1991 to provide assurance of New Zealand's freedom from arboviruses (particularly bluetongue virus) that affect sheep and cattle. Other arboviruses of veterinary concern include epizootic haemorrhagic disease virus, Akabane virus and bovine ephemeral fever virus.

Arboviruses are taxonomically diverse but their general characteristics include infection of vertebrates. They replicate in and are spread by insect vectors in the biting midge genus *Culicoides* (Diptera: Ceratopogonidae). New Zealand is the only place in the world apart from Antarctica where the *Culicoides* genus is not present. However, there is a low likelihood that the route of introduction to New Zealand would be through windborne dispersal of the vector species *C. brevitarsis* from Australia owing to its wider distribution, high abundance and documented dispersal capability (Burgin et al., 2013). Studies of other arthropod incursion events suggest that *C. brevitarsis* could be blown from Australia to New Zealand in the predominant westerly winds of the region (Burgin et al., 2013).

In New Zealand, *C. brevitarsis* and *C. wadai* are of particular importance owing to their tolerance of cooler environments, and are likely to establish in some parts of New Zealand.

The surveillance strategy has three components:

- an early warning system for reporting suspicious cases;
- herd testing; and
- vector surveillance.

Early warning system

The Ministry for Primary Industries (MPI) maintains an exotic pest and disease emergency hotline that enables early reporting of suspected new to New Zealand pests and diseases. This can be used to report suspicious cases of diseases in farm animals. Exotic terrestrial animal pest and disease investigations are managed by MPI's Diagnostic & Surveillance Directorate.

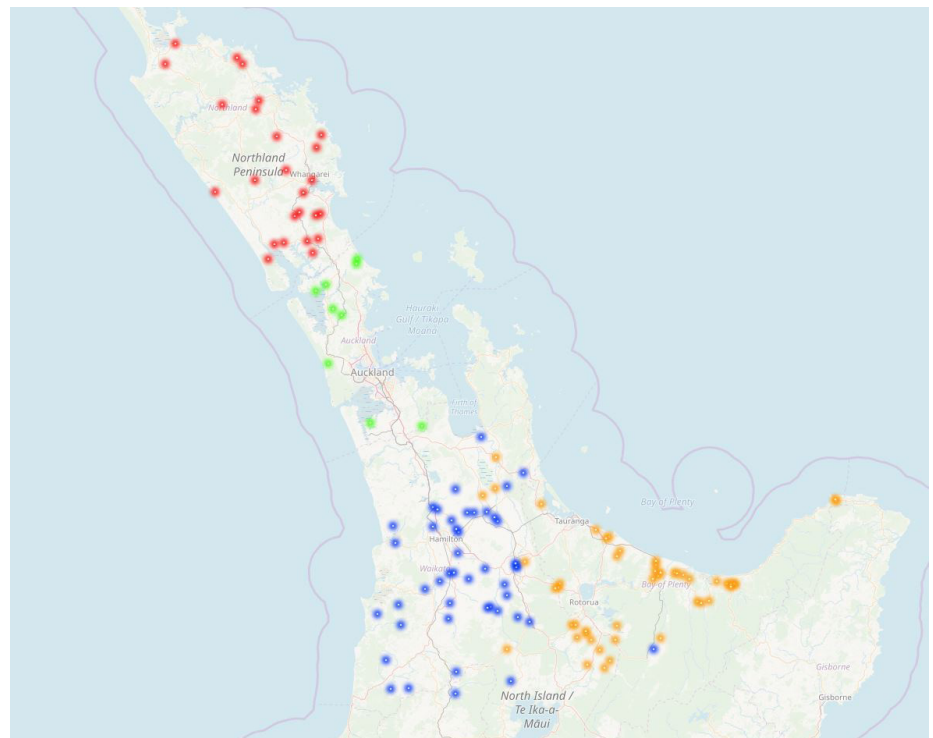


Figure 1: Locations of animal sampling for arbovirus in 2019

Herd testing

During 2019 blood was collected from 640 cattle on 32 farms in four districts that are considered to be most favourable for survival and establishment of *Culicoides* spp. (Figure 1). These are the areas where cattle would most likely be infected if the vector was present. Blood samples were taken for serological testing after the possible period of virus transmission (Wilson et al., 2008).

Vector surveillance

Light traps for vector surveillance have been placed in areas around New Zealand where wind-blown dispersal and subsequent establishment are likely. The traps attract the winged adult midges as they fly during dawn and dusk. They also catch other insects that are of no consequence. Catches are examined under a microscope to confirm absence of *Culicoides* spp.

Twelve light traps with green LEDs (Bishop et al., 2004, 2006) were deployed this season on cattle farms. Vector surveillance was undertaken from February to April inclusive, the period during which conditions are considered most favourable for midge activity. Ideal

trapping nights are when the overnight temperature does not fall below 14°C. Traps are not deployed during weeks of the full moon, whose light would compete with the light attractant. The light traps are run on three consecutive nights of each selected week.

Results

The aim of herd testing is to detect serological evidence of exposure to bluetongue, epizootic haemorrhagic disease, Akabane and bovine ephemeral fever viruses. All 638 blood samples sent to the Animal Health Laboratory, (Wallaceville) in 2018 tested negative by ELISA for antibodies to these viruses. Results from the blood samples collected this season in 2019 will be confirmed in the September 2020 issue.

Light trap test results from the 2019 surveillance season

Insect samples were processed by MPI's Plant Health and Environment Laboratories (Tamaki and Christchurch) in early 2019. It was estimated that 136,632 insects were screened from 120 traps over a 10-week period, but no *Culicoides* spp. were found. There were

197 native midges (Ceratopogonidae) trapped, which suggests that the traps would catch *Culicoides* species if they were present this season.

References

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