

Role of climatic and environmental factors in the BTV-8 epidemic 2006 in Northern Europe

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The current outbreaks in Belgium, the Netherlands, Germany, France and Luxembourg were the first reports of BTV north of 51 degrees latitude in Europe. The conditions in the regions affected now are not comparable in terms of climatic and topographical factors to the previous outbreaks in the Mediterranean. However, the enormous spread of the epidemic in the recently affected areas confirmed that, under certain conditions, BTV can rapidly spread in Europe also into regions where *Culicoides imicola*, the main vector known to transmit the disease in Southern Europe, is not present.

The mechanisms underlying the current bluetongue epidemic are unclear, particularly the relative role of geographic, climatic and wildlife factors influencing the establishment and the spread of the disease.

The timing and distribution of bluetongue outbreaks have been linked to climate and other environmental factors at a range of scales. Whilst temperature and moisture levels modulate key events in both the BTV transmission cycle and in the lifecycle of its *Culicoides* vectors, the wind is responsible for the passive dispersal of midges and, in turn, for the rapid spread of the diseases they carry. Landscape elements such as land-cover and topography also influence patterns in *Culicoides*-borne diseases, probably via their effects on habitat availability, both for *Culicoides* and their ruminant hosts, and also through disturbed wind dispersal over rough terrain. The confirmation of infections in wildlife during the current outbreak indicates that these species could potentially act as reservoir hosts for BTV. The presence of wildlife species is therefore considered here, alongside that of other hosts, among the suite of environmental factors that could impact the distribution and spread of BTV.

The presentation represents a first attempt to identify and explore potential environmental factors, including wildlife that may affect the establishment and spread of BTV in the outbreak region. These potential risk factors can then be used to generate and test hypotheses concerning the establishment and spread of BTV and on the relative impact of the different factors.