

Bluetongue in 2014: mainland France remains free from Bluetongue; BTV-1 epizootic in Corsica is under control

Jean-Baptiste Perrin (1)* (jean-baptiste.perrin@agriculture.gouv.fr), Stéphanie Desvaux (1), Corinne Sailleau (2), Emmanuel Bréard (2), Cyril Viarouge (2), Laure Bournez (3)*, Stéphan Zientara (2)

(1) Directorate General for Food, Animal Health Office, Paris, France

(2) ANSES-University Paris-Est, Maisons-Alfort Laboratory for Animal Health, UMR ANSES, INRA, ENVA, Maisons-Alfort, France.

(3) ANSES, Unit for the Coordination and Support of Surveillance, Laboratory Affairs Department, Maisons-Alfort, France

*Management team member of the French National Epidemiological Surveillance Platform for Animal Health (ESA Platform)

Abstract

Results of the active and passive surveillance of Bluetongue (BT) in 2014 demonstrated the absence of virus circulation in continental France for the fourth consecutive year. This confirms the official "free from BT" status that continental France recovered on 14 December 2012, after four years of compulsory (2008-2010) and voluntary (2010-2012) vaccination campaigns. The vaccination campaign organized by the official services in Corsica in order to control the BTV-1 epizootic which occurred in September 2013 seems to have been successful since no outbreak has been reported on the Island since May 2014. Clinical vigilance is highly recommended in continental France and Corsica, considering the high risk of introduction through movements of infected animals or through passive dissemination of infected vectors (from Sardinia to Corsica for example).

Keywords

Bluetongue disease, Surveillance, Outbreaks, Ruminants, Category 1 health hazard, Regulated disease

Résumé

Fièvre catarrhale ovine en 2014 : maintien du statut indemne en France continentale, maîtrise de l'épizootie de sérotype 1 en Corse

Les résultats de surveillance événementielle et programmée de la fièvre catarrhale ovine (FCO) en 2014 ont permis de démontrer l'absence de circulation virale en France continentale pour la quatrième année consécutive. Cela permet de confirmer le statut indemne de ce territoire acquis le 14 décembre 2012, après quatre années de vaccination obligatoire (2008-2010) puis volontaire (2010-2012). La campagne de vaccination organisée par l'Etat en Corse pour maîtriser l'épizootie de FCO de sérotype 1 apparue en septembre 2013 semble avoir porté ses fruits puisqu'aucun foyer de FCO n'a été déclaré dans l'île depuis mai 2014. La vigilance s'impose en France continentale comme en Corse, considérant le risque élevé que le virus soit introduit, via les mouvements d'animaux vivants infectés, ou par la diffusion par le vent de vecteurs infectés (depuis la Sardaigne vers la Corse notamment).

Mots-clés

Fièvre catarrhale ovine, surveillance, foyers, ruminants, danger sanitaire de 1^{ère} catégorie, maladie réglementée

This article summarizes Bluetongue health situation in 2014. It has been written before reoccurrence of the disease in 2015.

In 2014, there were two schemes in place for surveillance of Bluetongue: outbreak surveillance and programmed surveillance (Box 1).

Results of surveillance for Bluetongue

Outbreak surveillance in mainland France

In 2014, investigations concerning clinical suspicions of BT were conducted in 33 *départements* (Figure 1). In total, 108 cattle from 33 separate farms, 77 sheep from 19 separate farms, one goat and one roe deer were subjected to virological analysis (performed by the NRL or a DTL) following a clinical suspicion of BT. Virological analyses ruled out all suspected cases notified; no case of BT was confirmed in mainland France in 2014.

Three clinically suspect sheep were found in a batch of animals imported from Romania in October 2014. It should be noted that, even though the animals came from a region that was BT-free at the time, the BT virus was already circulating in other regions of the country. This suspicion gave rise to preventive management measures (immediate slaughter of the entire suspect batch). As in the other cases, the suspicion was lifted once negative PCR results were returned for the suspect animals.

The clinical suspicions were mainly reported between the months of July and December (Figure 2), which corresponds to the period during which cases of BT are most likely to emerge. It is possible that veterinarians take the seasonality of risk into account in their differential diagnosis and only declare clinically suspect cases in summer or autumn. Another possibility is that the frequency of occurrence of

clinical signs suggestive of BT actually fluctuates seasonally, possibly due to one or more enzootic diseases that themselves fluctuate seasonally. However, this hypothesis cannot be investigated because no information on the real origin of clinical signs is collected when the suspicions of BT are refuted.

In some *départements* with large populations of ruminants, the absence of notifications of clinical suspicions of BT may reflect a decline in the vigilance of farmers and veterinarians. Indeed, the clinical signs of the disease are not especially pathognomonic, and syndromes suggestive of BT should often be encountered in animal husbandry (Box 2, and Zanella *et al.*, 2010). The list of clinical signs suggestive of BT, together with a slideshow presentation including relevant photographs, can be downloaded from the website of the ESA Platform. The DDecPPs were invited to again raise awareness among the network of mandated veterinarians as to the need for clinical vigilance regarding this disease, especially as regards cattle from BT-regulated areas (Spain, Italy, Eastern Europe).

Programmed surveillance in mainland France

Over the course of the year, each *département* (except those with very small ruminant populations) was required to perform serological analyses, preferably on 15 young cattle (otherwise on sheep or goats) from three farms, with a national objective of 1,350 tests. A total of 1,149 serological analyses were finally declared to have been performed by the DDecPPs during 2014 in the annual report of animal health, which is a national rate of 85% (map of the departmental performance rates in Figure 3). It seems necessary to increase awareness among those taking part of the need to achieve a better rate, particularly in the *départements* where no results of programmed surveillance for BT were reported in the SIGAL national information system.

In line with instructions, 100% of these analyses concerned cattle.

As in 2011, 2012 and 2013, no viral circulation was detected on the French mainland through programmed surveillance in 2014 (see previous editions of *Bulletin Épidémiologique* - REDs).

According to the data recorded in Sigal, close to 7% of non-negative results were obtained from among the serological screening tests performed by the DTLs, but none of these analytical suspicions were confirmed following further investigation. This proportion seems to

have decreased compared to 2013 (when it was equal to 9%), but remains non-negligible. It is therefore appropriate to continue the effort to respect the criteria for selection of animals (unvaccinated cattle under the age of two years), to ensure that no animal sampled for serological screening was present during the epidemics of 2008-2009 and/or vaccinated during compulsory vaccination campaigns.

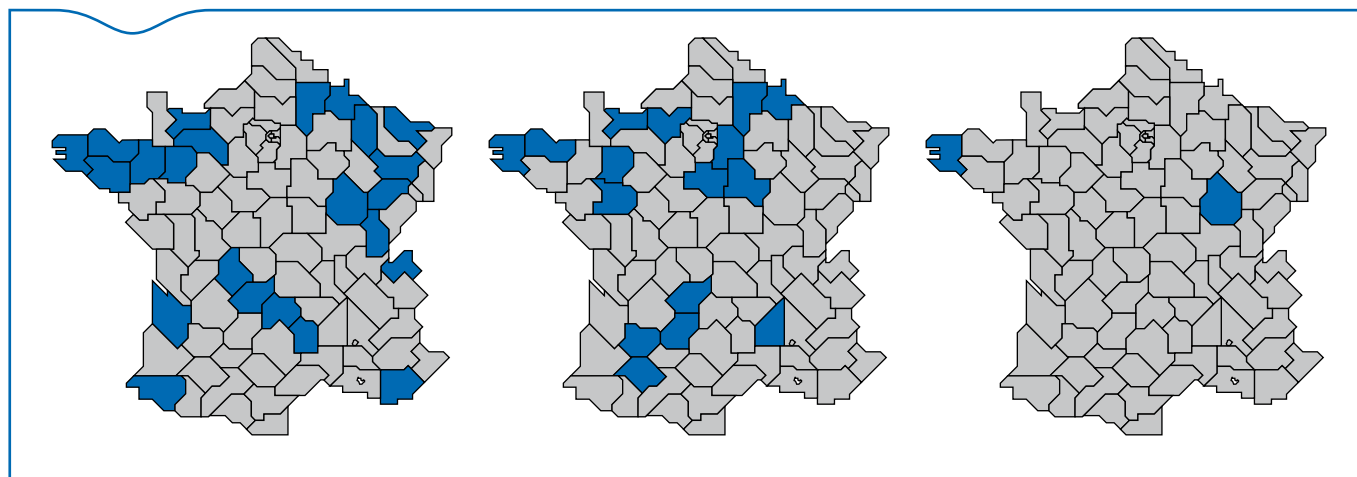


Figure 1. *Départements* in which clinical suspicions of BT in cattle (left), in sheep (centre) or in an unspecified species (right) were reported in 2014 (in blue: at least one clinical suspicion notified, in grey: no clinical suspicion notified)

Box 1. Surveillance and control measures for Bluetongue in mainland France in 2014

Bluetongue monitoring in 2014 in mainland France was based on two schemes: outbreak and programmed surveillance (entomological surveillance was abandoned on 1 January 2013 following the recovery of disease-free status).

Objectives of the surveillance programme

- To detect the introduction of any exotic serotype (including serotypes 1 and 8).
- To provide evidence for the maintenance of disease-free status for mainland France.

The population monitored

Domestic ruminants.

Outbreak surveillance

Clinical surveillance requires that all holders of animals from susceptible species and all mandated veterinarians notify the administrative authorities of any clinical signs suggestive of BT. Following notification, the suspect farm is placed under surveillance. A description of the clinical signs suggestive of BT is available online on the website of the ESA Platform (www.platform-esa.fr), and in Memorandum 2013-8188 of 20/10/2013 relating to notifications of clinical suspicions of Bluetongue.

Programmed surveillance

Programmed surveillance in 2014 was organised in such a way as to comply with the European regulation (EC No 1266/2007) for the monitoring of BT in disease-free areas: an annual serological survey capable of detecting a prevalence of 20% with a degree of certainty of 95% per geographical unit, which means taking 14 samples per geographical unit per year. In France, the geographical unit chosen was the *département*. Each *département* must take annual samples from fifteen animals from three different herds.

These samples should preferably be taken from cattle of less than two years of age, not having been vaccinated against BT and exposed to the bites of *Culicoides* (i.e. put out to pasture during the summer).

Diagnostic protocol

In 2014, following the recovery of disease-free status for mainland France, the first-line analyses in cases of clinical suspicion were performed by the NRL, ANSES Maisons-Alfort. Diagnosis was carried out by group- RT-PCR analysis (meaning that it was not specific for a particular serotype).

For programmed surveillance, serological analyses consisted of ELISA tests carried out by the accredited departmental testing laboratories (DTLs). If non-negative results were obtained by a DTL, the suspect animals were re-sampled for virological analysis (RT-PCR) carried out by the NRL. This re-sampling was put in place because BT virus can be detected in blood samples several months after infection.

If the RT-PCR is positive (which did not occur in 2014 for animals in mainland France), viral isolation, which is the reference analysis for confirmation of an outbreak, must be performed.

Health control measures in place for 2014

In the event of clinical or analytical suspicion, the farm of origin is placed under Prefectural monitoring order (APMS) pending the results of investigations performed by the NRL.

If an outbreak of BT is confirmed in a disease-free area, the national emergency health intervention plan is implemented by the Prefect.

Regulatory References

Council Directive 2000/75/EC laying down specific provisions for the control and eradication of bluetongue

Commission Regulation (EC) No 1266/2007 on implementing rules for Council Directive 2000/75/EC as regards the control, monitoring, surveillance and restrictions on movements of certain animals of susceptible species in relation to bluetongue

Ministerial Order of 22 July 2011 (amended) establishing the technical and administrative framework applicable to Bluetongue control in mainland France

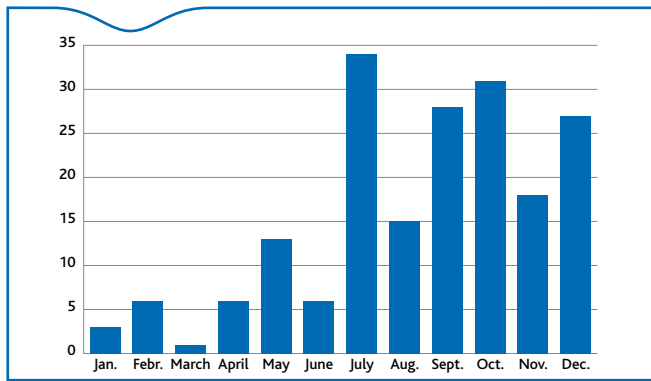


Figure 2. Number of clinical suspicions declared by month

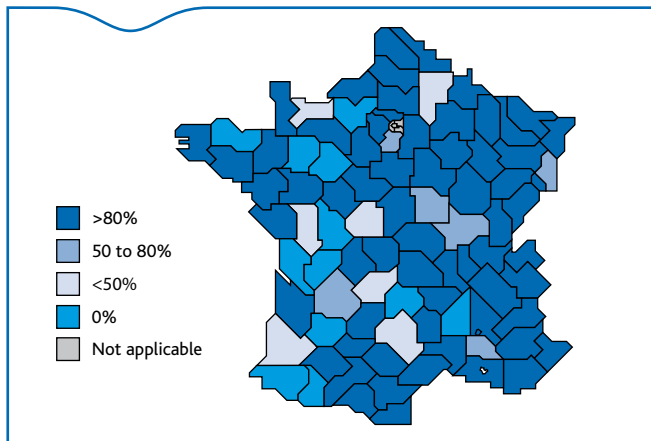


Figure 3. Rate of BT sampling by département based on the number of samples declared by the DDecPPs in 2014

Costs

In 2014, the State spent approximately €45,500 on monitoring BT in mainland France, €32,000 for programmed surveillance and €13,500 for targeted surveillance.

The cost of programmed surveillance corresponds to the cost of ELISA screening analyses (€13,500), of PCRs for refuting non-negative results (€6,500) and veterinary procedures (€12,000).

The cost of targeted surveillance includes the cost of PCR analyses (€11,000) and veterinary procedures (€2,500).

These sums do not take into account the cost of running and managing the technical and financial aspects of the scheme, particularly in terms of human resources delegated by the administration.

The costs of control measures for the BT epizooty in Corsica are given in Box 3.

Discussion and outlook

Following two mandatory vaccination campaigns (2008-2010) and two voluntary vaccination campaigns (2010-2012), the two serotypes of BT introduced into mainland France (BTV8 and BTV1) are no longer detected in mainland France. No outbreak of BT has been identified in mainland France since June 2010 (Table 1), which enabled it to be declared a disease-free territory on 14 December 2012. Disease-free

Box 2. List of clinical signs suggestive of BT

Attention, when examining an animal with a clinical picture suggestive of BT, a differential diagnosis must be performed to exclude foot-and-mouth disease with certainty (in particular, it is necessary to verify the absence of vesicles).

General signs

- Listlessness, depression
- Decrease in milk production
- Reduced appetite, anorexia
- Prostration, inability to stand
- Weight loss/muscle loss
- Tachypnea, dyspnea, noisy breathing
- Fever

Limbs

- Stiffness
- Limping
- Oedema and/or congestion of coronary bands
- Oedema on pasterns, fetlock, shin, knee/hock

Head

- Congestion of the muzzle
- Erosions/ulcers/crusting on the muzzle or nasal mucosa
- Congestion of the mucosa of the mouth
- Erosions/ulcers of the mucosa of the mouth
- Oedema of the tongue
- Nasal discharge
- Salivation
- Cyanosis of the tongue (bluetongue)
- Oedema of the inter-mandibular surface and/or of the muzzle
- Conjunctivitis, lacrimation

Udder/vulva

- Congestion of the teats or udder
- Erosions/ulcers/crusting on the teats or udder
- Erosions/ulcers of the vulva

status was maintained in 2014, but continued vigilance is required, considering the epidemiological situation in certain neighbouring countries (Spain and Italy) or Eastern Europe (because of the frequent introduction of ruminants from these zones).

Table 1. Change in the number of BT outbreaks between 2006 and 2014

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of serotype 1 outbreaks	0	3	4,932	9	1	0	0	0	0
Number of serotype 8 outbreaks	6	15,257	27,510	77	0	0	0	0	0

References

- Perrin J.-B., Gallois M., Sailleau C., Bréard E., Viarouge C., Clément T., Guis H., Dominguez M., Hendrikx P., Zientara S., Calavas D., 2013. Surveillance and control of the 2013 Bluetongue serotype 1 epidemic in Corsica. Bull. Epid. Santé Anim. Alim., 60, 8-11.
- Desvaux S., Lobjoit G., Berland C., Havet A., Malhere C., Havet P., Perrin J.-B., 2015. (Brief) Outbreak of Bluetongue in sheep (serotype-1) in Corsica: Report for 2013 and 2014. Bull. Epid. Santé Anim. Alim. 64, 23.
- Zanella G., Chartier C., Biteau-Coroller F. 2010. Clinical signs of BT due to serotype 8 in France. Bull. Epid. Santé Anim. Alim. 35, 10-12

Box 3. Surveillance of the bluetongue epizooty in Corsica in 2014

The results for 2013-2014 of the epizootic episode in Corsica were presented in a short item published in Issue No. 67 of the *Bulletin Épidémiologique* (Desvaux S. *et al.*, 2014).

Background and context

Serotypes 2, 4 and 16 of bluetongue emerged on the island in 2000, 2003 and 2004 respectively, with a peak in the epizooty in 2001 when 326 outbreaks of serotype 2 were confirmed. No outbreaks were confirmed between March 2005 and September 2013.

The programmed surveillance scheme for Bluetongue in Corsica (serological screening of calves at the slaughterhouse) has historically followed different procedures from those in mainland France (virological analysis). In 2013, a new protocol for programmed surveillance, based on RT-PCR analysis of calves at the slaughterhouse, was put in place so as to include Corsica in a programme that meets the requirements for regaining BT-free status, in accordance with the regulatory EU requirements. This approach, initiated in July 2013, was interrupted in September by the emergence of clinical outbreaks of BT in the south of the island.

The emergence of serotype 1 in Corsica, very probably introduced from Sardinia, and its rapid spread in the island, was the subject of an article in the *Bulletin Épidémiologique* of December 2013 (Perrin *et al.*, 2013).

Since the purpose of programmed surveillance is to demonstrate the absence of viral circulation, it was not revived during 2014 because the virus was still circulating.

Outbreak surveillance

Outbreak surveillance follows the same procedures as in mainland France. In 2014, only 31 outbreaks were confirmed (for 107 suspicions) throughout the island despite a surveillance system continuously on

alert. Suspicions continued to be reported, although they were less often confirmed (29% of confirmations in 2014 against 79% in 2013). From mid-May 2014, no outbreaks were confirmed, although 33 suspicions were declared and investigated between June and December 2014.

Control measures

Corsica remains a regulated zone for serotypes 1, 2, 4, 8 and 16. Suspected outbreaks of BT therefore do not trigger implementation of a contingency plan. The farms where the virus is identified are placed under APDI, prohibiting the movement of ruminants to and from these farms (except where derogation is granted by the Prefect). This APDI is lifted sixty days after the vaccination of all ruminants present on the holding.

Two compulsory vaccination campaigns were organised, fully financed by the State (covering both the doses and the vaccinations). The first campaign took place from 26 November 2013 to 31 May 2014 (Ministerial Order of 26 November 2013). The second started in July 2014 and ended on 30 June 2015 (Ministerial Order of 4 July 2014). For the first campaign, about 70% of domestic ruminants were vaccinated by mandated veterinarians: approximately 85% of sheep, 30% of goats and 65% of cattle. Most ruminants were vaccinated between January and March 2014.

This quite satisfactory rate of vaccination, in particular in the case of sheep, probably played an important role in the control of the epizooty, explaining the absence of outbreaks reported since June 2014.

Estimated costs (excluding VAT)

In 2014, 1,365 PCR analyses were performed in Corsica, for a total amount of approximately €50,000 in analysis costs and €40,000 in veterinary fees. The vaccine doses administered in 2014 cost €360,000, plus €390,000 in veterinary fees.