CONTROL / PREVENTION

Strategies for the control of BT differ according to whether outbreaks of the disease occur in endemic regions or in areas where the disease is not usually present. In the latter case the usual goal is eradication, whereas in endemic areas attempts can only be made to limit the occurrence of the disease and its economic impact.

In endemic areas, such as most of the African continent, a wide variety of domestic and wild ruminants (including cattle, goats and various species of antelope) can act as sources of BT virus. Immunization of cattle should therefore theoretically help to limit the incidence of BT, but the presence and ubiquitous distribution of other reservoirs, both known and unknown, makes eradication of the disease impossible.

To date, BT virus has been isolated from seven species of Culicoides, of which at least four play an important role in the transmission of BT in Africa and North America. Worldwide, a considerably greater number of species have been implicated in transmission of BTV and it is likely that more species of Culicoides, and even other insects, may be identified as biological vectors in future. Air-borne transport of infected Culicoides midges over long distances cannot be prevented, but unless the insects can establish themselves in the new environment epidemics which arise in this way are self-limiting unless the midges resident in the new region can themselves then transmit the virus (as apparently occurred recently in Europe).

Methods used to control Culicoides include the use of insecticides, larvicides and sterilization of males by irradiation, as well as the subcutaneous administration of ivermectin to cattle in an attempt to break the primary cycle before the infection spills over into sheep. Protecting sheep from exposure to Culicoides is a more practical approach and can be achieved by avoiding low-lying wet pastures, stabling animals from...
late afternoon till morning, shearing in early summer to allow some wool growth before the onset of the BT season in late summer, and even the use of insect repellants.

Prophylactic immunization of sheep remains the most effective and practical control measure against BT in endemic regions. Vaccines comprised of attenuated virus strains are highly effective, especially in epidemic situations where only one serotype of BT virus is involved. In endemic areas such as South Africa, the situation is complicated by the existence of multiple serotypes. This necessitates the use of polyvalent vaccines with attendant problems resulting from interference between virus strains, differences in immunogenicity and growth rates between various strains, as well as differences in the response of individual animals to the components of such vaccines. To overcome these problems, three pentavalent vaccines have been developed in South Africa. They are administered to sheep at three-week intervals and repeated annually. After two or three annual immunizations, most sheep are immune to all the serotypes in the vaccine.

In addition to the inconvenience of repetitive inoculations of a multivalent vaccine there are some risks involved in the use of live attenuated vaccines and some important precautions must be observed when using them. Pregnant ewes should not be immunized during the first half of pregnancy, as brain defects may result in the foetus.

There are also indications of temporary infertility in both ewes and rams vaccinated for the first time, necessitating immunization well before or after the mating season. However, this should not pose a problem if sheep are vaccinated before they reach breeding age. More theoretical objections sometimes raised against the use of live attenuated vaccines include the possibility of reassortment and recombination between attenuated and virulent strains, resulting in reversion to virulence or even the production of new serotypes, and the possibility that insects may spread the vaccine virus. Circulation of
live attenuated vaccine virus in animals and insects has been unambiguously proven in Europe recently, as has reassortment of vaccine viruses with field virus.

Much progress has been made towards the development of safe, efficient, multivalent recombinant vaccines which should contribute significantly to the control of bluetongue, hopefully in the near future. However, until that time, it is likely that live-attenuated and inactivated BT virus vaccines will be used in areas where the virus is endemic and causes disease.