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Mapping Brucellosis Restricted Herds

R.F. Hammond

Introduction

Previously reported work (Hammond and Lynch, 1992) outlined the role of Geographical Information System (GIS) technology in the mapping of herds restricted due to bovine tuberculosis in County Kildare. This paper reports the use of GIS in mapping the national distribution of brucellosis restricted herds.

Method

A pro forma designed by ERAD is in use to collect the following data at District Veterinary Offices (DVO) throughout the country:

- Herd Number
- Home and Out Farm
- National Grid Co-ordinates
- Single or Multiple Reactors
- Active Infection (Y/N)
- Depopulated (Y/N)
- Epidemiology Factors
  - Buying In
  - Contiguous Herds
  - Other
  - Dealer Involvement

Data collected by DVO personnel were collated and forwarded to the Tuberculosis Investigation Unit. The data underwent transformation into the prepared data base in Dbase III Plus\(^1\). This was used as a point file within Mapinfo\(^2\) to produce maps showing the distribution pattern, at national and county level for all brucellosis herds.

Results

Examples of the GIS output from these analyses are presented in Figs. 1 and 2. These demonstrate the location of all herds which were restricted and/or depopulated during 1991 (Fig. 1) and of those herds in which the restriction, on epidemiological grounds, was attributed to the purchase of cattle already infected with Brucella abortus (Fig. 2).

Discussion

The use of GIS technology in these investigations facilitated the recognition of possible spatial relationships between affected herds and provided a basis for more extensive analyses. Meanwhile, in a paper entitled "Review of the Bovine Brucellosis Position" delivered at the Irish Co-operative Organisation Society/ European Community Seminar held in Portlaoise in November 1992, Mr. M. Sheridan, ERAD made the following observations:-

"Of the 155 individual restrictions, 47 herds were confirmed as having bought in the source of their infection directly, 62 herds were considered to have picked up the disease from a neighbouring infected herd and the balance or 46 herds, which included some false positives, were mainly situations where the information available did not allow the District Veterinary Office to come to a firm conclusion as to the source of the disease. Thus leaving aside the 62 contiguous infections there were a maximum of 93 primary new outbreaks of brucellosis in 1991 of which 47 have been identified as being caused by bought in animals." (Sheridan, 1992).

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\(^1\) Dbase III Plus. Ashton-Tate, 20101 Hamilton Avenue, Torrance, California 90502-1319, USA.

\(^2\) Mapinfo. Version 4.0 for IBM Personal computers and Compatibles. Mapping Information Systems Corporation Troy, NY, USA.
References


Figure 1. The spatial distribution of the 155 breakdowns in 1991 separated into depopulated and restricted herds. Brucellosis in cattle.
Figure 2. The spatial distribution of the 47 herds associated with the buying in factor which is one of three epidemiological factors (buying in, contiguity and other). Brucellosis in cattle.