Biomathematics & Statistics Scotland

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BioSS is a leading international centre in the field of mathematics and statistics applied in the biological sciences. Originally established in 1987 as the Scottish Agricultural Statistics Service (SASS) to support the R&D programmes of the Department of Agriculture for Scotland (now SOAEFD), it provides research, consultancy and training to the SABRIs, SAC and other agricultural, biological and environmental organisations in Scotland, through a network of 30 specialists based in Edinburgh, Aberdeen, Ayr and Dundee. BioSS has its headquarters on the King's Buildings science campus of the University of Edinburgh, but for administrative purposes, it operates as a Unit of SCRI and its Director (Rob Kempton) reports to the Director of SCRI. BioSS publishes an annual 3-year Corporate Plan and a Biennial Report.

The BioSS programme covers four main objectives as follows: consultancy 46%; research 33%; technology transfer 16%; training 5%. These objectives are closely linked and synergetic. Thus, research into development and novel application of statistical/mathematical methods supports and is stimulated by consultancy work; statistical and mathematical methods, which have proved their usefulness in public-sector research, can be promoted more widely through technology transfer; and the training programme, though representing a small proportion of BioSS overall activity, provides an efficient mechanism for upgrading scientists' knowledge and skills, complementing the provision of individual advice.

BioSS research ranges widely to cover most of the R&D programmes sponsored by SOAEFD. Particular strengths are in design and analysis of crop, animal and sensory experiments; analysis of images from microscopes, medical scanners and remote sensing; modelling epidemics in plants and animals; statistical genetics and bioinformatics; and environmental modelling, including wildlife management and monitoring water quality. There is also a growing involvement in the social sciences, oriented to consumer, psychological and behavioural studies. This research involves extensive interaction and collaboration with scientists in SABRIs and SAC, and with UK universities and international research laboratories. BioSS also runs a successful postgraduate research programme with 10 PhD students currently linked to five Scottish universities.

The BioSS unit at SCRI is led by Jim McNicoI and consists of three core-funded staff. In addition, two research assistants undertaking PhDs are funded through SOAEFD's Flexible Fund, and a postdoctoral research scientist, funded by the BBSRC initiative for Genetics of Agriculturally Important Traits, is currently being appointed. The Unit has particular strengths in statistical genetics and bioinformatics. Current research topics include methods for mapping quantitative trait loci in tetraploid species such as potato; identifying the degree of similarity among species based on molecular marker data; and phylogenetic methods, including identification of mosaic sequences (formed by recombination), in bacteria and viruses. Other research is in spatial and temporal modelling, including the estimation of trends and competition in field experiments using smoothing methods and models for vegetation dynamics. Staff based at BioSS Headquarters also collaborate with SCRI scientists in projects relating to the interpretation of images from magnetic resonance microscopy, the modelling of crop epidemics, and the sensory assessment of soft fruit. One result of this collaboration is the publication of 27 papers in refereed journals and 10 conference presentations over the last 3 years (1995-7).

BioSS received a core grant of £635k from SOAEFD in 1997/8. Receipts from SOAEFD Flexible Fund and work for Scottish Agricultural Science Agency are estimated at £187k and external income at £170k. The income of the Dundee Unit in 1997/8 was £74k, in addition to its core funding