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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers University in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public. Articles appearing in these proceedings are divided into two sections.

The first section includes lecture notes of papers presented at the 1998 New Jersey Turfgrass Expo. Publication of the New Jersey Turfgrass Expo Notes provides a readily available source of information covering a wide range of topics. The Expo Notes include technical and popular presentations of importance to the turfgrass industry.

The second section includes research papers containing original research findings and reviews covering selected subjects in turfgrass science. The primary objective of this section is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann B. Gould, Editor
Dr. Bruce B. Clarke, Coordinator

OVERVIEW OF TURFGRASS RESEARCH IN THE UNITED KINGDOM

Dr. P. M. Canaway[1]

In Britain, unlike the United States, there are no large university turfgrass research programs, and consequently, most research in Britain is concentrated at the Sports Turf Research Institute (STRI). Some British universities are engaged in turfgrass research, for example, the work of Bill Adams at the University of Wales, Aberystwyth, with whom we collaborate, but there is no university-based research on the scale seen in the United States.

STRI's research program encompasses four main areas: research for governing bodies of sports; commercial research; grass testing; and laboratory services. At the present time, we have a large program of research for different sports. These include golf, soccer, cricket, tennis, rugby league, horse racing, and greyhound racing. Research for golf comprises the largest element of specific sport-related research and includes a number of projects including: fine tuning the USGA green construction method for United Kingdom conditions; the need for an intermediate layer in golf green construction profiles (funded by the USGA); alternative materials to peat for use as amendment materials in golf green rootzones; studies on earthworm biology and control; compilation of a European research database; a water resource assessment study for golf courses around one of the Open Championship venues; and a project on the status and distribution of heather on British golf courses. (Heather is a shrubby plant growing in northwestern Europe, which forms a significant hazard on many traditional golf courses in Britain.)

RESEARCH FOR INDIVIDUAL SPORTS

Soccer

Many of the research problems concerning soccer in terms of construction and drainage have been solved, but now with the development of large stadia we are seeing deterioration in turfgrass swards due to the shade produced by these large stands, etc. Consequently, Dr Stephen Baker has undertaken some research to look at the interaction between shade and grass cultivar (variety) selection for these situations. Clearly, with developments in modern stadium architecture, this is an area where further research is needed.

Cricket

For cricket, we have had a large, ongoing research program in collaboration with Bill Adams at the University of Wales. This program consists of three main areas of work: construction of cricket pitches using different materials and sub-bases; the choice of grasses for use on cricket pitches (in contrast to most turfgrass areas, cricket pitches are constructed of very heavy, clay soil material); and a monitoring program to analyze soils taken from real pitches and relate these to game performance etc.

Tennis

The research we undertake for tennis is intimately linked to the last remaining grass court Grand Slam tournament at Wimbledon. We have been agronomic advisors to Wimbledon for many years, and usually some of our re-

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searchers are present during the whole of the Championship to monitor the progress of wear on the courts. As part of our ongoing research for tennis, we also undertake trials for wear tolerance for turfgrasses specifically designed for grass court tennis. These trials are subjected to intense wear periods concurrently with the Championships to try and improve the selection of grasses for increased durability under this very special type of use. This last year's Championships were dogged by bad weather, but hopefully next year will see some sun so that Pete Sampras and friends can all do their best!

Horse Racing

As regards horse racing, this is an area that is very much under-researched in our country. There has been negligible research on such basic matters as the best grasses for horse racing. Recently, we were fortunate to secure a grant from the ruling body of horse racing in Britain (the Jockey Club) to undertake some trials on grass selection and also another trial on techniques on aeration and compaction relief in horse race tracks. Dr Stephen Baker has been conducting these trials at the Nottingham Race Course, which is in the Midlands of England. His team has also been involved developing playing quality standards for rugby league where we have seen considerable problems occurring due to the changeover from winter play to summer play that has occurred in the last couple of years.

Greyhound Racing

Returning to the racing front, Dr Amanda Cook, Dr Stephen Baker, and others have been involved in a large research program for the greyhound racing authorities. In Britain, greyhounds race on sand tracks but, again, little research has been undertaken to determine the optimum types of sand to provide the best racing conditions for greyhounds and to minimize injuries to the dogs. Injuries can occur as a result of track design features or the use of inappropriate materials and maintenance on the tracks. Once again, this is a very under-researched area, and consequently, the findings that the team has uncovered have greatly increased the knowledge available to race track managers.

COMMERCIAL RESEARCH

On the commercial research front, the STRI has had a full portfolio of commercial trials for pesticide manufacturers and other manufacturers of different products through the turfgrass industry. The STRI is a European Union-recognized official efficacy testing station, and, therefore, results of trials on pesticides are recognized for registration purposes through the rest of Europe. The remaining work involves a variety of work testing trials including fertilizers, turf tonics, novel constructional materials, seed coatings, and occasionally, even novel buggies and golf carts!

GRASS CULTIVAR TESTING

The STRI is the only organization in the United Kingdom that tests grasses for the sports, golf course, and amenity sector and produces an annual "Turfgrass Seed" booklet that gives guidance to end users on a choice of cultivars (varieties) for use in different situations. This is the role that is carried out by NTEP in the United States; other countries also have their own national testing systems (e.g., Germany and the Netherlands). The STRI grass testing program is quite large with some 6500 test plots in Bingley, and possible evaluations are made by objective rather than subjective means. Although there is some subjective work, for example in visual merit, in today's litigious world we would rather measure leaf width, shoot density, and so forth. The grass testing program is headed by Dr Andrew Newell, and he also undertakes some research on light levels in stadia, etc. as referred to above as well as some commercial testing work for seed companies and others.

LABORATORY SERVICES

On the laboratory services front, Dr David Lawson is responsible for the soil chemical laboratory and also the fertilizer research referred to above. With recent problems surrounding water supplies, Dr. Lawson is receiving increased numbers of samples from clubs, etc. seeking alternative sources of water. The pathology labo-

ratory is headed by Dr Kate Entwistle (nee York), who also is responsible for the pesticide testing referred to earlier. In this last year or two, Dr. Entwistle has encountered some diseases previously only seen in the United States (e.g., *Curvularia* and necrotic ring spot. We are not sure whether this due to better recording or whether the implications of climate change are such that the weather conditions are becoming more favorable for what are to us novel pathogens. I recently read an article that said that mole crickets are native to southwestern Britain. I just hope they stay there and do not decide to spread northwards or into our golf greens! I know what a problem what these creatures are for superintendents in the southern part of the United States. If climate change brings mole crickets to St Andrews, the hallowed turf will quite literally never be the same again!

EXTENSION

STRI's extension services have never been busier with increasing numbers of clubs requiring visits. We visited about 1000 golf clubs in the United Kingdom, Ireland, and continental Europe in 1998, and we have similar numbers of other subscribers to different types of sports areas (e.g., soccer (Wembley), lawn tennis (Wimbledon), rugby (Twickenham, Murrayfield), municipal authorities, schools, private sports clubs, etc). In recent years, we regionalized our agronomy service to ensure that clients can easily be reached from a local office rather than from our HQ at Bingley. We have also set up a local office in the Netherlands. Growth areas for us have been golf course architecture and golf course ecology. Our senior golf course architect, Jonathan Tucker, has gradually been building up his portfolio of architectural work, and his services are increasingly in demand, particularly as he is a former agronomist to the Royal and Ancient Golf Club of St Andrews and, therefore, has great knowledge of traditional links-type courses. With increasing environmental concerns, our senior ecologist Bob Taylor has also had an increasing workload requiring a devotion of additional staff resources to ecological work. Bob Taylor has had a big impact on golf course superintendents, raising the awareness of the need for environmental management on the golf course, particularly through his book "Ecological Management of the Golf Course."

Finally, if you would like to contact the STRI, you may visit us on our web site: *www.stri.org.uk*, or contact us at our e-mail address: *info@stri.org.uk*.