

## **SPORTS TURF AERATION – RESEARCH PROJECT**

The IOG 2012 fund seeks to provide grant funding for innovative research into the maintenance and management of outdoor surfaces for sport. The fund has been established to provide a conduit for research into sports turf and seeks the collaboration of governing bodies and others within sport to provide partnership and financial support for the fund. The England and Wales Cricket Board (ECB) has offered support to towards a joint research project into the aeration of fine turf areas, and the 2012 fund is now seeking partners to undertake this research programme.

The anticipated funding from the 2012 fund for this project is circa £60K, with a maximum timescale of 4 years.

### **Introduction**

Soil aeration has long been recognised as necessary to create a healthy environment for plant roots and beneficial micro-organisms living within the soil. The challenge faced by the grounds manager is to ensure there is a good macropore network from the surface down through the full rooting depth to maintain the exchange of oxygen from atmosphere and the soil, and yet still produce a surface which meets all the playability requirements for the sport in question. In natural turf sports pitches, aeration has become an integral part of turfgrass management practice and over the years has become mechanised with the introduction of an increasing range of mechanical equipment.

Fine turf areas like cricket squares and grass tennis courts are engineered systems whereby the clay-dominated construction soil is deliberately compacted by rolling to provide the consistent pace and bounce required to uphold the fundamental character of the games. The compaction of moist soil to prepare a cricket wicket (or grass court) is completely at odds with recommended management procedures for good soil husbandry. Because the strength characteristic of the soil is so critical for cricket and lawn tennis, the interaction of deliberate compaction coupled with controlled drying allows the strength of the clay-dominated soils to be controlled. The negative effect of this can be, however, a rooting environment that is not optimal for a high quality grass sward. Though wet-dry cycles lead to some re-structuring of the soil, mechanical aeration is often seen as a required operation to optimise grass quality during post season renovation works.

Very little research has been conducted on aeration practices for cricket square management, and aeration on cricket squares continues to be a controversial issue with some top class squares receiving no aeration yet still performing consistently, in contrast with others who aerate intensively and yet also produce high quality surfaces. Though the operational mechanics of aeration practices are well understood and the mode of action of the various machines is well established, there remains a lack of fundamental knowledge as to how such operations affect and are effected by natural soil structural processes. The interaction between soil water dynamics, cohesive and frictional strength characteristics, density, compaction and pore size distribution in soils during de-compaction operations is poorly characterised and understood. In addition, how these interactions occur temporally during wetting and drying phases is critical to understanding when such operations should be carried out for optimal results. For this reason, any such work must consider seasonality and look at a system over several growing seasons.

The practice of aeration also provides management problems for the cricket groundsman; with autumn and early winter the only time machinery can be used to aerate the square without the need for immediate re-compaction, and when irrigation or natural rainfall has allowed the surface to soften sufficiently to allow tine penetration.

## **Key aims for this research**

- To review current research into aeration on natural sports turf.
- To investigate the fundamental effects and interactions of aeration on soil mechanics and the behaviour of the different soils commonly used to construct such surfaces.
- To investigate the influence of aeration techniques and management of the soil structure.
- To investigate the influence of machinery types and configuration on the performance of machines used for aeration with reference to machine, types, tine design, and operating depths.
- To investigate optimum soil moisture levels for aeration and to clearly establish how such operations effect soil pore distributions through both drying and wetting cycles
- To develop and test improved soil management strategies and practical guidelines for fine turf sports surfaces, bringing together new and existing work to develop a preferred practise for cost effective pitch aeration practices, with particular reference to cricket squares and outfielders.
- To evaluate the influence of aeration on pitch performance.
- To establish scientifically based maintenance specifications and recommendations for a range of user levels.
- To determine the practical cost benefits ratios of proposed management systems.
- To link the research on fine turf aeration with other key research projects – such as rolling optimisation.

## **Confidentiality**

ECB/IOG reserves the right to use the results of the research and any published material on the subject

## **Submission details**

Please complete submission details and return by September 1<sup>st</sup> 2007

To:

The Chief Executive  
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Research partners interested in consideration for this project will be required to submit a brief to include the following details:

1. Details of your organisation to include:
  - portfolio of appropriate and relevant research:
  - facilities available to be used for projects
2. Proposed project time scale
3. Proposed project start/completion date
4. Proposed project cost
5. Breakdown of costs
6. Proposed programme for:
  - Project methodology and scoping
  - Project delivery programme
  - Outputs proposals
  - Details of proposed research team
  - Draft agreement
  - How you propose to link with relevant sports governing bodies, and other interested parties within the industry

**Signed for and on behalf of:**

Signature:

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Name:

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Title:

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Organisation:

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Tel No:

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E-Mail address:

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Date:

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