

Number/code: OM/SM10

Title: STADIUM ORGANIC OR ARTIFICIAL PITCH

Guidelines section:

| | | | |
|--------------------------|------------|-------------------------------------|-------------------------------|
| <input type="checkbox"/> | Governance | <input checked="" type="checkbox"/> | Operational management |
| | | <input type="checkbox"/> | <i>Context of the event</i> |
| | | <input type="checkbox"/> | <i>Event</i> |
| | | <input checked="" type="checkbox"/> | <i>Stadium management</i> |
| | | <input type="checkbox"/> | <i>Procurement</i> |
| | | <input type="checkbox"/> | <i>Mobility and logistics</i> |

Description

The New Lawn, home of the English Football Club Forest Green Rovers, is considered to be the ‘world’s greenest football club’: the club promoted a set of sustainability initiatives that have allowed it to substantially reduce its ecological footprint, becoming in 2018 the world’s first UN certified carbon-neutral football club. These initiatives include a particular choice in terms of turf treatment. In particular, it is characterized by an organic pitch, which basically means artificial pesticides and fertilizers are not used, and a solar power mow-bot that goes around and treat the pitch 24/7. The club’s organic playing surface, spread using Scottish seaweed, is thought to be the first of its kind in the world. Efforts in this area are further supported by an autonomously driven mower which produces organic mulch that fertilises the pitch as it cuts the grass¹.

Their process for growing an "organic" pitch avoiding the use of chemicals includes:

- 90 tonnes of sand injected into the pitch to improve drainage.
- Fraise-mowing which removes the grass leaf but allows mature roots to remain and provide a “nursery” for new grass-seed.
- Another 90 tonnes of top sand.
- 15 bags of grass-seed containing six different types of rye-grass.
- 3 tonnes of organic fertiliser with seaweed, magnesium and soil improver.
- Watered with 800 litres of compost tea.
- They also added 20 litres of coconut wetting agent which helps water flow evenly to all parts of the soil profile, and prevents over/under-watering.

Alternative pitches include artificial ones. Today artificial turf is becoming popular again in the European football leagues. The turf of the ‘80s was nowhere near the quality of the turf today, and several clubs in the lower leagues are adopting this option, but does it represent an environmentally sustainable and cost effective option? Allianz Park has been equipped with an artificial bespoke pitch which will see water consumption fall by 100%. The pitch forms part of an overall goal to become the most sustainable ground in the UK, an idea which has been strengthened by meeting the requirements of the building Regulations 2010 Part L policy.

Environmental impacts

¹ <https://www.kksadvisors.com/blog/sustainability-forest-green-rovers>

These practices avoid the negative environmental impacts deriving from pesticides and fertilizers used for natural grass.

The choice of having an organic pitch along with the daily monitoring thanks to the mow-bot, allows the club to avoid the use of chemicals or other detrimental substances that can alternate the quality and the duration of the turf.

An artificial bespoke pitch ensures good athletic performance and lower levels of water and fertilizers consumption. For instance, artificial turf surely promotes significant water savings. According to Sustainability in Sport, a pitch requires on average 20,000 litres of water a day to keep it in 'prime condition'². Research in the US showed that each full-sized rectangular artificial turf field saves between 1.8 million to 3.7 million litres of water each year³, as the need for irrigation is totally eradicated.

In addition to this, natural grass fields require frequent maintenance, including mowing and fertilizing (for non-organic grass), the use of lighting rigs for stimulating grass growth (depending on the region or months of the year), and periodic reseeding. Chemicals such as fertilizers and herbicides, which produce greenhouse gas (GHG) emissions when manufactured, are used for growing and maintaining non-organic turf grass⁴. The use of fertilizers and pesticides leads to contaminated run-off that is also potentially harmful to the environment, and though some herbicides and fungicides are still needed for artificial surfaces, they are in lower quantities than those needed for natural grass⁵.

However, also artificial turf poses some environmental concerns in terms of chemical leaching, stemming from the infill material that is typically derived from scrap tires. Tire rubber crumb contains a range of micro-plastic contaminants and heavy metals that can volatilize into the air and/or leach into the percolating rainwater, thereby posing a potential risk to the environment and human health⁶.

On the other hand, natural grass reduces surface temperatures and has the ability to store atmospheric CO₂ in the soil as organic carbon. Synthetic pitches, on the contrary, can reach temperatures of 70°C on a hot day, up to 40% hotter than a natural field. This is not only uncomfortable for players but can also contribute to the urban heat island effect, increasing local air temperature by up to 4°C.

Lastly, if well-maintained, a grass pitch is theoretically self-renewing, and even if the surface is replaced, the waste is still biodegradable. Synthetic pitches on the other hand pose a problem at end of their life span in terms of waste disposal. Technological developments are however increasing the life span of artificial turf and recycling technology is also being developed that has the potential to recycle 99% of pitch materials⁷.

² <https://www.edie.net/library/Levelling-the-playing-field/6367>

³ <https://www.fidra.org.uk/is-grass-always-greener-evaluating-environmental-impact-of-synthetic-sports-pitches/>

⁴ https://cdn.ymaws.com/www.syntheticurfCouncil.org/resource/resmgr/Docs/Cheng_H._._Environmental_Hea.pdf

⁵ <https://www.fidra.org.uk/is-grass-always-greener-evaluating-environmental-impact-of-synthetic-sports-pitches/>

⁶ However, a limited number of studies have shown that the concentrations of volatile and semivolatile organic compounds in the air and heavy metals and organic contaminants in the field drainages were generally below the respective regulatory limits:

https://cdn.ymaws.com/www.syntheticurfCouncil.org/resource/resmgr/Docs/Cheng_H._._Environmental_Hea.pdf

⁷ <https://www.fidra.org.uk/is-grass-always-greener-evaluating-environmental-impact-of-synthetic-sports-pitches/>

Economic impacts

The practice allows to reduce the costs related to the purchase and consumption of pesticides and fertilizers.

With regard to costs, a grass pitch is much cheaper to install as it costs up to £100,000 per pitch compared to £400,000-800,000 for installing an artificial pitch. However, despite the high initial costs, an artificial surface provides increased revenue by giving a speedier return on the initially larger investment⁸. For example, with regard to the Allianz Park, estimates suggested costs savings of £100,000 a year on turf repairs⁹. Artificial surfaces have less regular maintenance costs, while natural turf has generally quite high costs for equipment, fertilizers, chemicals, and water¹⁰. When the capital and operating costs of artificial and natural turf are compared to actual usage over a 12-year life span, calculations show that artificial turf per game costs are approximately 65 per cent cheaper than natural grass¹¹.

Higher income could also be achieved by opening the stadium up for more outside events without any negative effects on the condition of the pitch. For instance, one of the most appealing features of artificial turf is its durability. A standard natural grass sports field can accommodate approximately 360 games per year while a lit artificial turf field has the capability of accommodating approximately 2,080 games per year during prime time hours. This works out to an approximate 6: 1 ratio¹².

Applicability and replicability potential

The practice adopted by the Forest Green Rovers F.C can be (potentially) applied in any stadium. However, the replicability potential is linked to the specific environmental condition and positioning of each stadium. More specific data cannot be found through desk research on the actual costs and replicability potential of this practice.

Good quality artificial bespoke pitch might be designed to satisfy almost all athletic needs. Natural grass and artificial turf each have their advantages and limitations. The choice of one over the other must be contextualized and different factors should be taken into account (e.g. its component parts, the context of its climate, whether it's designed for professional use or for communities etc.). A well-managed artificial pitch may be an appropriate choice where the alternative is a fertilized, water intensive, pesticide-heavy professional pitch. On the other hand, a poorly maintained synthetic pitch is not only a poor environmental choice, but also a poor playing surface. It's about choosing the right pitch for the right location and use¹³.

⁸ <https://www.fidra.org.uk/is-grass-always-greener-evaluating-environmental-impact-of-synthetic-sports-pitches/>

⁹ <https://www.climatechangenews.com/2013/01/25/saracens-to-scrum-down-at-uks-most-energy-efficient-rugby-stadium/>

¹⁰ https://cdn.ymaws.com/www.syntheticurfCouncil.org/resource/resmgr/Docs/Cheng_H._._Environmental_Hea.pdf

¹¹ <https://archive.lib.msu.edu/tic/stnew/article/2000jun8.pdf>

¹² <https://archive.lib.msu.edu/tic/stnew/article/2000jun8.pdf>

¹³ <https://www.fidra.org.uk/is-grass-always-greener-evaluating-environmental-impact-of-synthetic-sports-pitches/>

Sources

BBC - Gloucestershire, England

Artificial Bespoke Pitch

Saracens Artificial Pitch