

Sports Turf Manager

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History of Sports Field Turfgrass Surfaces

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Outdoor games, in which teams attempt to hit, carry, kick, or throw some form of a varied-shaped ball into, over, or across the opponents designated goal have a long history in most parts of the world. Early “team” games frequently involved no rules, an unlimited number of “players” – usually male, and even playing fields that extended from one village to the next. This combination resulted in dangerous body contact of all sorts, serious injuries and even death. Eventually a few competition rules for these ancient games may have been agreed to by the competing teams on game day. The playing surface could be composed of varying types of undulating landscapes including streams and vegetation ranging from trees to bare areas. The location was decided by the local host team. The first truly nation-wide rules for many sports were not developed until the 1850 to 1900 period in Great Britain. This resulted in sports within other countries responding similarly.

Proper documentation as to the true origins of most outdoor sports played on grass has been lost in the mists of antiquity. While recognizing this limitation, attempts

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ESPECIALLY SHEEP.

are made herein to suggest a possible time frame for key cultural practices based on scattered bits of historical records. Many of the team sports surfaces eventually evolved to a grassy surface kept short by grazing animals, especially

OTS HIGHLIGHT

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sheep. The evenly distributed rainfall and intensive sheep husbandry in Great Britain contributed to this country being a pioneer in the development of turfgrass sports surfaces. These play areas were being “marked off” by the late-1440’s. An early technique for marking the boundaries was via a plow furrow.

During the 1500’s areas of land were being designated and reserved as sites for sports activities.

Initiation of Cultural Inputs.

Rolling became important for bowls and cricket as clubs were formed and a permanent ground acquired. Manuring was avoided or infrequent, especially on larger sports fields so that laborious



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OTS HIGHLIGHT
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Sport	First Played	
	Rules As Now Known	On Turfgrass
Lawn Bowls	c. 1600's	c. 1700's
Cricket	late-1600's	c. 1700's
Horse Racecourse	c. 1700's	c. 1800's
Soccer	1815	1815
Field Hockey	mid-1800's	mid-1800's
Baseball	1845	c. 1870's
Australian Rules Football	1858	1858
Lacrosse	1860	late-1860's
Rugby	1865	1865
Croquet	c. 1860's	c. 1860's
Lawn Tennis	1870	c. 1870's
American Football	c. 1880's	c. 1880's
Polo	c. 1860's	?
Softball	1934	1934

Table 1. Approximate time when team sports were played (a) with rules comparable to those now used and (b) on turfgrass.

wicket surface prior to play was a very early cultural practice. Eventually patches of excessive grass growth not removed by grazing sheep would have been cut by manual scything.

Turfgrass Cultural Practices Evolve.

Team sports ground construction and cultural practices probably did not come into common usage until the 1850 to 1900 period. This coincides with nationalization of rules and extensive organization of sports clubs. Just how many of the groundsmen were employed part-time versus full-time is unclear. Dual use of sports fields was commonly practiced in the formative years from 1850 to 1900, with cricket outfields being used in the winter for soccer, field hockey, and/or even rugby.

Sodding.

One may be surprised that a number of pioneering basic cultural practices originated for use on sports surfaces other than golf courses. Sodding was practiced on bowling greens by at least 1663. However, it was in Scotland that sodding came to the fore in the early-1700's via the use of natural sea-marsh turfgrass. The seaside salt marshes were preferred sod

manual scything would be minimized. This was a reasonable approach in the early days of relatively light usage and low turfgrass quality expectations of those who played on what were usually pasture areas. In-season shoot growth could vary significantly depending on the rainfall pattern, as supplemental irrigation was not available. Removal of excess vegetative growth was by the grazing of rabbits and/or sheep. As animal grazing also results in animal excrement, "sweeping" the bowling green and cricket

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Known Year	Cultural Practice
1660's	Sodding of bowling greens
early-1700's	Rolling of bowling greens
1700's	Sheep grazing of team sports fields
mid-1700's	Rolling of cricket wicket tables
late-1700's	Sand patching of thinned and damaged surfaces
1800's	Systemic method of root zone construction for bowling greens
1870's	Construction of surface contoured sports fields for drainage
1880's	Field surface markings for team sports fields - internal
c. mid-1800's	Manual-push mowing with reel units
late-1800's	Manual graiping/forking
late-1800's	Horse-drawn, single reel mowing
early-1900's	Horse-drawn rolling of sports fields
1912	Horse-drawn, gang-reel mowing
1920's	Light-weight sports field motorized power units
1935	Manual core cultivation
late-1930's	Tractor-drawn spiking and slicing units

Table 2. Chronological stages in the initiation of turfgrass cultural practices on various sports field surfaces. Year listed is when written documentation is available, but may have been utilized earlier.

harvesting sites as they were dominated by salt-tolerant bentgrass with a minimum weed content, plus fine-textured silt soils that facilitated ease of turfgrass cutting, lifting, and trimming.

For centuries turfgrass sods were manually harvested using a long-handled “turving iron” and “gauge box” plus “sheering knife” for underside soil trimming. Then a sled-like harvesting device was developed in the early-1900's that was attached to a set of long handles with a crossbar for kicking the fixed sod blade forward via a foot action. Larger horse-drawn sled cutters eventually evolved. It was not until 1944 that a motor-powered, mechanical sod cutter was invented.

Rolling.

A second pioneering turfgrass cultural practice first used on bowling greens in Great Britain was rolling. It was being practiced by at least 1700 using heavy, carved stones. Rolling of cricket wickets followed by at least the mid-1700's, and was widely practiced in the early-1800's.

The rollers used evolved from carved stone to solid elm wood, to cast iron, to metal water ballast types. These rollers were manually pushed until the 1920's when motor-powered tractors became available to pull gang units.

Patching.

What evolved to the practice of topdressing an entire green or cricket wicket probably originated as what was termed “sand patching”. When this practice was introduced lacks documentation. However, the need for smooth bowling greens probably led to patching by at least the late-1700's when rolling

use expanded. When organic materials were used in patching bare areas, they also were beneficial in stimulating turfgrass recovery as this was the only external source of key nutrients.

Early topdressing was applied by slinging in an arc with a flat-mouth shovel. Eventually a manual-push, side-wheel mechanical topdresser was developed in the early-1900's. The practice of topdressing declined during and after World War II. Its use did not increase until the development of the motor-powered, mechanical topdresser in the 1960's.

Manuring.

The early nutrient application practices used animal manure. Aging in piles allowed particle fractionation that facilitated more uniform applications. This approach eventually evolved to what is now known as composting in the 1800's. The source of organic material for composting ranged from animal manures/scraps, as from abattoirs, to plant materials such as leaves and seed by-products. Layering of various organic

sources with sandy soil in piles became a common procedure, followed by periodic mechanical turning.

Use of manures declined in the 1920's, due to expansion of motor-powered vehicles and a resultant major reduction in the horse population, especially in urban areas. Consequently “artificial manures” or fertilizers came into common usage. The primary composition of these early fertilizers was from mineral sources.

Grazing/Mowing.

Animals were the original biological mowers for sports played on grassy surfaces. Primitive turfgrass bowling greens were probably located on sites grazed by “cunnigers” or rabbits. The same probably occurred for cricket wickets. Early cricket outfields and soccer fields were biologically mowed with sheep.

An undulating, grazed pasture would have patches of excessive vegetative growth. As the desire for improved playing surfaces emerged, these patches would probably have been cut manually with a scythe. Just when this evolved is unclear.

The first manual-push mower was invented in 1830. Bowling greens were probably the first to be uniformly cut with a mechanical mower, since ball roll is a very basic aspect of the game. Just when or if push, reel mowers were used on other types of sports turfgrass surfaces is unclear. The horse-drawn, reel mower was invented in 1843. It was in use on some sports fields by the late-1800's. The multi-gang, horse-drawn, reel mower was invented in 1912, and was converted to a tractor-drawn variation in the 1920's. Development of the multi-gang, reel mower was a major advance in the maintenance of turfgrass sports fields.

Graiping.

As the intensity of play on turfgrass sports surfaces increased problems with soil compaction became a concern in sustaining a turfgrass cover. Impaired internal soil drainage of water and eventual turfgrass thinning were warning symptoms. Physical disturbance of the soil by manual “graiping” or forking came into use by the late-1800’s. This was a laborious, time-consuming practice on compacted clay soils, especially if dry. This procedure was used on a 4 – 6 inch (10 – 15 cm) spacing for areas as large as one acre (0.4 ha) or more.

Early turfgrass cultivation by graiping involved a fork with 4 – 5 fixed, solid, flat, metal tines mounted on a wooden handle. It was physically forced into the soil primarily by the downward pressure of the human foot. Soil openings were accomplished via horizontal displacement. A significant advance in 1935 was a manual coring device. The advantage was the physical removal of a vertical soil core. It involved 3 – 4 fixed, hollow, metal tines mounted on a wooden handle. As with forking, it was physically forced into the soil by the downward pressure of a human foot. The soil core was pushed upward out of the hollow tine and dropped onto the turfgrass surface. An effective powered, mechanical coring machine was not invented until the 1950’s.

Systematic Root Zone Construction.

During the 1800’s the first known widely-adopted systematic method for construction of root zones evolved in Scotland for bowling greens. The “Scotch Greens” were flat in contrast to the

crowns of northern England, and thus internal drainage of excess water was desired to minimize cancellation of play days. This indicated a need for construction on sand sites. However, many bowling greens sited in villages and estates around Scotland were on poorly-drained native soils.

The solution developed in Scotland was construction of a root zone thought to have improved internal drainage of water. This method consisted in variations of the following “soil-less” profile: digging a flat subbase, placement of clay pipe drains at a 9 – 21 foot (2.8 – 6.4 m) spacing, spreading a 6 – 12 inch (15 – 30 cm) deep layer of coarse clinker, broken stone or brick-bats, adding a 1 – 3 inch (2.5 – 7.6 cm) thick layer of fine ash, and topped with 1 – 3 inches (2.5 – 7.6 cm) of sand upon which the sea-marsh turfgrass was laid. This method eventually

was widely used in bowling green construction throughout Great Britain.

Closing.

The evolutionary history of turfgrass cultural practices spans almost two centuries. The major developments up to the 1950’s are addressed herein. Most of the changes have been in response to increased intensity of use, quality demands, and safety concerns. •

THE EVOLUTIONARY HISTORY OF TURFGRASS CULTURAL PRACTICES SPANS ALMOST TWO CENTURIES.

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