THE ART & INVENTION ERA

-in the Early Evolution of Turfs 1830 - 1952 (Part 2)

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The first part of this article was published in our July 2002 Bulletin issue 217.

Twelve developments that highlighted the turfgrass discovery and invention era are summarised in Table 1 (shown on page 32). The first part of this article discussed developments 1 to 6, in this issue, Part 2, the author outlines developments 7 to 12.

Development 7 - Turfgrass Fungicide

During the late 1920s and early 1930s two fungicides for the control of a number of turfgrass diseases were developed by Dr's John L. Montieth and Arnold S. Dahl of the USDA-USGA Arlington Turf Research Center in Washington, D.C., USA. The first truly effective fungicide controls for the control of *Microdochium* patch, *Rhizoctonia* brown patch, *Sclerotinia* dollar spot, and *Typhula* blights involved the use of inorganic mercury and cadmium compounds, which continued in use for 40 years.

Development 8 - Rotary Mower

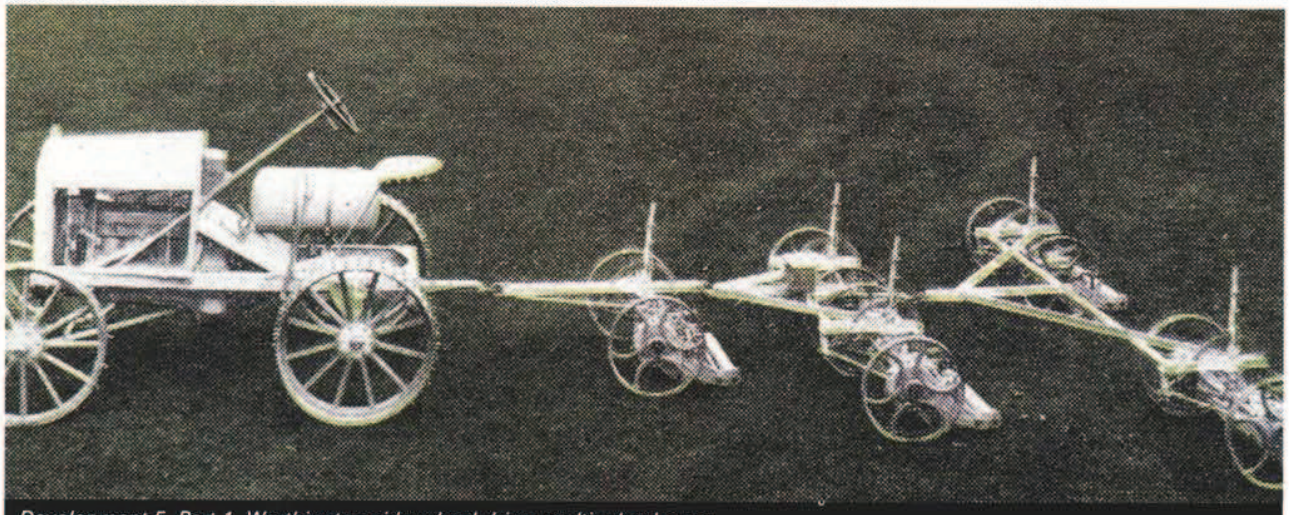
In the 1930s the first powered rotary mower was developed by W. Waters in the United States. This resulted in the capability to mow minimal maintenance turfs at a higher height and a less frequent interval, which are conditions in which reel-type mowers are not effective.

Development 9 - Popup Sprinkler Head

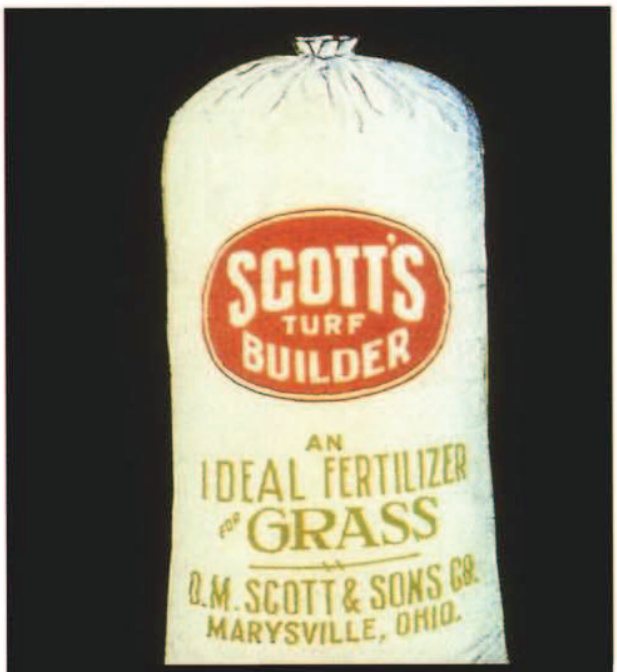
In the early 1930s the first underground pop-up sprinkler head was developed by the Thompson Company in California, USA. This was a major advance compared to the numerous types of individual, fixed, hose-end sprinklers of the oscillating or rotating type previously available, as they had to be manually moved frequently for effective irrigation.

Development 10 - 2,4-D: Selective Broad-Leaved Weed Control

In the mid-1940s the first truly effective herbicide for the selective removal of broad-leaved weeds from perennial grasses was developed by Gretchen Fannie-Fern Davis in Washington, D.C., USA. Some of the earliest turfgrass tests were conducted on the turfed mall area between the U.S. Capital and Washington Monument. The development-use strategy for 2,4-D on turfgrasses was a major event. It remains a key herbicide in the management of quality turfgrass areas more than 50 years later.



Development 5. Part 1. Worthington side-wheel drive, multi-wheel gang



Development 6. Part 1. The first commercially produced Slow-Release Turf Fertiliser

Development 11 - Powered Coring Machine

In 1946 the first powered coring machine was invented by Thomas C. Mascaro in Pennsylvania, USA. A manual three- to four-tined coring unit was developed in England in the 1920s. However, it was not a widely used practice because of the very intense manual labour involved. It was not until the development of the mechanically-powered, hollow-tined coring unit by Tom Mascaro that extensive coring of intensively trafficked turf areas came into widespread usage, and continues to be used.

Development 12 - Vertical Cutting Machine

In 1952 the first powered vertical cutting machine was developed by Thomas C. Mascaro of Pennsylvania, USA. Thatch had been a continuing problem on turf areas for a long time, and there was no truly effective way of selectively removing an excessive accumulation of thatch, other than the total physical removal of the turf-thatch profile with a sod cutter and re-establishment. For the first time in 1952 there was an efficient, effective method for vertical cutting into the turf canopy and removing the excess, dead organic material without totally destroying the living turf canopy. The basic design of the original vertical-cutting unit continues to be the standard in use to this day.

Summary

In our modern times of the 21st century some of these developments seem of minimal significance. However, at the time they were developed or invented these contributions were very major advances in improving the quality and lowering the cost of turfgrass maintenance. Modern turfgrass science evolved gradually based on these early inventions and art-dominated trial-and-error developments between 1800 and 1952. These pioneering individuals and companies need our utmost respect for their very important contributions.

Development 1 Part 1. The Budding manually-pushed reel mower

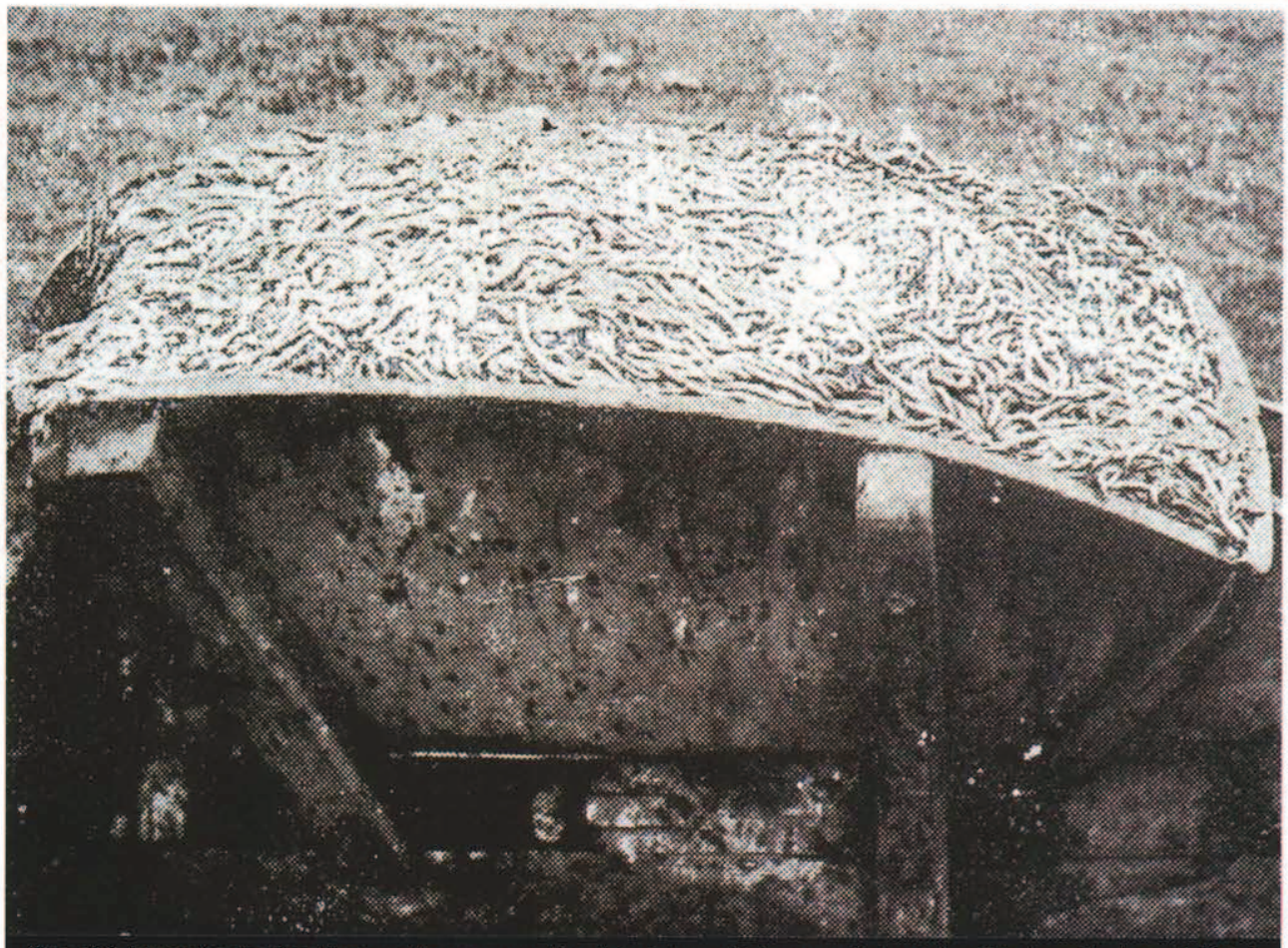
Table 1. 12-KEY EVENTS IN THE TURFGRASS DISCOVERY AND INVENTION ERA *(as referred to in para one of Part 1)*

Year (circa)	Contribution/Invention	Contributor
(1) 1830	reel, mower, mechanical hand pushed	Edwin Beard Budding, England UK
(2) 1843	cylindrical clay tile drains	England, UK
(3) 1880	weed-free grass seed processing, testing and marketing	O.M.Scott, Ohio, USA
(4) 1890	irritant for earthworm management/control	P. W. Leeds, England, UK
(5) 1914	side-wheel driven mowers on multiple-gang frame	Worthington Co., Pennsylvania, USA
(6) 1928	slow-release (organic) turf fertiliser	O.M.Scott &Sons Company, Ohio, USA
(7) 1930-32	turfgrass fungicide development	J.L.Monteith & A.S Dahl, Washington DC.,
(8) 1930	powered rotary mower	W. Waters, USA
(9) 1930-35	popup sprinkler heads	Thompson Co., California USA
(10) 1945	2.4-D selective broadleaf weed control	G.F.F.Davis, Washington DC., USA
(11) 1946	powered coring machine	T.C. Mascaro, Pennsylvania, USA
(12) 1952	powered vertical cutting machine	T.C. Mascaro, Pennsylvania, USA

Development 4 Part 1.
Watering in the earthworm irritant

A paper summarising the key early inventions and art-related developments in the evolution of turfgrasses has not been addressed. Thus, over the past two decades this author has spent considerable time in the major libraries in the United States and the United Kingdom, including the Royal Horticultural Society, Kew Gardens, British Museum, Victoria and Albert Museum, and various Sports Association libraries. Through extensive study of the limited literature from a large number of unrelated writings over hundreds of years, this author has assimilated and presents the following chronology of key turfgrass developments in the early years from 1830 to 1952. The criteria for their selection included the impact on all types of turf use and not just one segment such as golf turf.

This topic was first formally presented as a keynote address at the 9th International Turfgrass Research Conference in Toronto, Ontario, Canada, in July 2001. It is derived from a draft of a book on the history of turf being prepared by J.B Beard. ©2002 by James B Beard, 1812 Shadowood Drive, College Station, Texas, USA 77840.



One of 3 barrow loads of earthworms (we are repeating this picture which was unfortunately printed upside down in Part 1- Development 4)