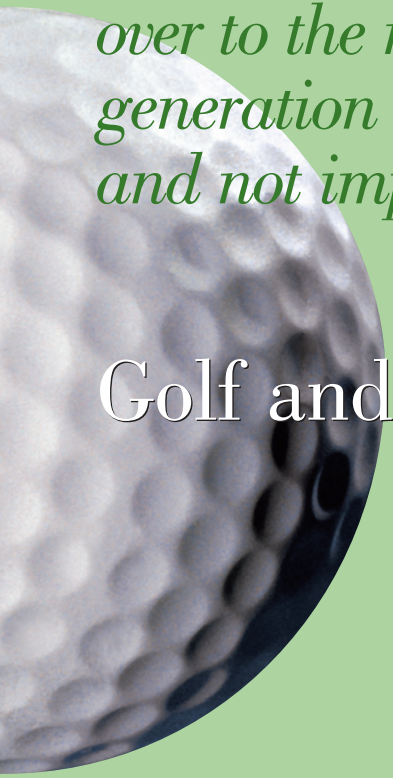
"The nation behaves well if it treats natural resources as assets which it must turn over to the next generation increased, and not impaired."

THEODORE ROOSEVELT



Golf and a Healthy Ecosystem

Detrimental Practices

INSECT TARGETED CHEMICALS which also kill pollinators and natural insect-eaters like bats, purple martins and blue birds, are significantly unhealthy for golfers and maintenance crews.

Golf course superintendents have been found to have a significantly increased risk of death from prostate, brain, lymphomic and intestinal cancers.

MONOCULTURE of plant material increases disease, ignores the natural beauty of the geographic region, and reduces wildlife diversity.

COURSE DESIGN that ignores the land's natural contours and compromises sensitive wetlands, habitats, endangered plants and animals.

UNDER STORY VEGETATION and dead trees removed, resulting in loss of wildlife habitat and an over-manicured, unnatural appearance.

Beneficial Practices

ORGANICS used to maintain healthy soil and plants.

DIVERSE NATIVE PLANTS increase wildlife diversity, lend local personality, do not require chemical treatments, and are drought resistant.

WILDLIFE encouraged and appreciated for its beauty and the balance brought to the ecosystem.

WATER FEATURES connected to habitat patches providing access to water, food, shelter, and breeding areas.

UNMOWN AND UNIRRIGATED out-of-play areas reduce maintenance costs and promote wildlife habitat.

COURSE DESIGN in consideration of the natural contours of the land to preserve ecosystems.

"The greatest domestic problem facing our country is saving our soil and water. Our soil belongs to unborn generations."

SAM RAYBURN

Golf Courses and Healthy Soil and Plants

Detrimental Practices

SYNTHETIC CHEMICALS destroy microbes and earthworms breaking the soil food cycle.

SOIL COMPACTION depletes oxygen.

LACK OF ORGANIC MATTER in initial course construction, especially sand constructed greens.

IMMATURE COMPOST containing phytotoxic compounds make turf more susceptible to disease, insects and weed invasion.

BARE SOIL causes heat that kills microorganisms and leads to topsoil erosion.

HERBICIDES inhibit root vigor, increase pest insect activity by suppressing predators, stress plants, and accelerate disease symptoms.

OVER WATERING depletes the soil of oxygen destroying the soil food cycle.

Beneficial Practices

GOOD COMPOST suppresses disease, reduces thatch, inhibits compaction, protects soil against temperature changes, and reduces palatability of plants to insects.

LONGER GRASS promotes more and deeper roots, and creates a denser canopy to shade the soil reducing temperature and moisture evaporation.

SEAWEED EXTRACTS, containing natural hormones, help plants produce more antioxidants which balance photosynthesis and respiration.

ORGANIC NITROGEN encourages microbe growth to compete with plant pathogens.

DIVERSE DISEASE RESISTANT GRASSES diminish pathogens and stress.

WALK-BEHIND MOWERS during wetter periods reduce compression caused by heavier triplex mowers.

"We never know the worth of water 'til the well is dry."

ENGLISH PROVERB

"Conservation is humanity caring for the future."

NANCY NEWHALL

Golf Course Water Conservation and Quality

Detrimental Practices

EXCESSIVE IRRIGATION promotes leaching, runoff of pesticides and fertilizers, and weakens plants.

OVERUSE OF SYNTHETIC CHEMICALS such as fertilizers, pesticides, fungicides and herbicides (bright green turf results in a cycle of over-watering that necessitates over-application of chemicals).

DRAINAGE DITCHES that allow erosion due to inadequate plant cover.

CUTTING GRASS to less than 1/3 length allows for erosion, sedimentation runoff, and arrested root growth.

WATER WASTE resulting from over irrigation. Typically a course in Central Texas uses an average of 350,000 gallons per day – enough to satisfy the daily needs of at least 2,300 residents.

Beneficial Practices

TURF GRASSES that are culturally and climatically appropriate, have minimal fertility requirements, and are drought and pest resistant.

BUFFER ZONES around water and drainage, planted with native vegetation and left in their natural state.

TESTING water periodically for quality.

EROSION CONTROL - judicial use of humus which holds 4 to 6 times it's weight in water, sustains in drought periods, prevents runoff and retains soil nutrients.

FERTILIZERS applied minimally.

IRRIGATION minimized.

CHEMICAL USE ELIMINATION - judicial use of organics and compost.

Evolution of Environmentally-Friendly Golf

1497

In Scotland - Golf is born using a stick and a pebble played around sand dunes, rabbit runs and tracks.

1764

First 18-hole golf course.

1800's

British Isles - Farmland borrowed for golf in the fall and winter.

1848

Mass-produced clubs and gutta-percha balls enable the average person to play.

1900

More than 1,000 courses in the US.

1910-1940

Architects are proficient in designs using the natural features of a site. No ability to move hundreds of thousands of yards of earth. Turf grass maintenance means close attention to soil fertility. Organic matter considered essential.

1950's, 60's & 70's

Precautionary use of strong chemicals in anticipation of non-existent problems. Superintendents lack composting skills. Course designs lack respect for the natural terrain. Design of courses for less-skilled golfers whose complaints become driving force in maintenance procedures.

1976

Invention of the Stimpmeter. Greens mowed lower and lower. Bragging rights for having the "fastest" greens.

1980's -1990's

Golf popularity surges. Environmental concerns grow as vast habitat land is modified and destroyed. Concerns intensify as facilities are placed within diminishing countryside resources. *A Practical Guide to Ecological Management of the Golf Course* by R.S. Taylor is released in the UK.

Late 1990's

Environmental regulations on golf course construction and maintenance increase in number and impact. New York passes restrictive pesticide regulations. Several counties ban all pesticide use on public land.

2000'S

Over 16,000 courses in the United States occupy over 1.5 million acres (as much as Delaware and Rhode Island combined). Environmentally friendly course architects aim to bring the environment to the golfer, rather than force the golf course upon the land. USGA and the GCSAA acknowledge environmental issues.

2020?

Golf course architect Michael Hurdzan says,"My hope is that courses in 2020 will look like those of 1920."