ENVIRONMENTAL BENEFITS OF NATURAL TURFGRASS

SFMA INSTITUTE OF SPORTSFIELD MANAGEMENT

Trap and Store Carbon

During photosynthesis, turfgrasses remove carbon dioxide and add oxygen to the atmosphere. With increasing levels of atmospheric carbon dioxide associated with the greenhouse effect, turfgrasses serve as a source of carbon storage, or sequestration. Grasses remove about 6 tons of carbon dioxide per acre per year from the atmosphere. Although some benefit is reduced by maintenance practices requiring fossil fuels (i.e. mowing or production of fertilizer), practices such as mowing, returning clippings, fertilizing, and watering increase the ability for turfgrass to sequester carbon. In other words, healthier plants mean more carbon storage. Over the course of a year, a 2,500 square-foot lawn absorbs enough carbon dioxide to produce oxygen for a family of four, and a soccer field can offset the carbon produced by a car driving 3000 miles. (1, 2, 3)

Dust and Pollen

Healthy turfgrass areas have few weeds, which reduce pollen levels. Regular mowing prevents grass plants and weeds from producing pollen-bearing seedheads and flowers. The fibrous root systems of turfgrass plants form soil netting that reduces dust. Leaf tissue also traps dirt and dust particles to protect air quality. About 12 million tons of dust is released into the atmosphere each year in the U.S., and much of it is trapped by grass. (3)

Controls Soil Erosion and Water Run-Off

Run-off and erosion of soil is considered one of the primary causes of nutrient contamination in water systems. Research shows that sediment loss from grass is negligible under normal rainfall conditions. A fibrous root system, characteristic of healthy turfgrass, holds soil in place and provides stabilization on both flat and sloping areas. A dense shoot and root system slows surface water movement and improves the likelihood of water infiltrating into the soil. The average soccer field can absorb 50,000 gallons of water before run-off occurs. Turfgrass systems help protect water sources by stabilizing soil and slowing and filtering run-off before it enters storm water drains or natural water bodies. (3, 4)

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Prevent Contaminants from Entering Water Sources

Turfgrass systems are efficient at holding onto nutrients and other pollutants. Nutrients like phosphorus are fixed onto soil particles or taken up by the plant and are not leached out readily. When fertilizer is applied to healthy turfgrass, nutrients are held in the soil and utilized by the plants. The root and thatch layer in turfgrass systems also effectively bind pollutants, such as oil, grease, and other household and industrial wastes. Grass buffer strips are frequently used around farm fields, streams, waterways, and in urban areas to filter soil and remove chemicals before they enter surface or groundwater. (2, 3)

Temperature Modification

Urban areas with fewer grasses and landscape plants are 10-15 percent warmer than rural areas. On a hot summer day, well maintained turfgrass is typically 30 percent cooler than asphalt and 14 percent cooler than bare soil. Research from Brigham Young University indicates that on an 81.4°F day, the average surface temperature on a natural grass surface is 78°F, while the average surface temperature on asphalt is 109°F. Turfgrass cools the atmosphere through the process of transpiration. Water evaporates through the stomata, tiny openings in the grass blades, which cools the grass plants and surrounding environment. Transpiration helps reduce temperatures in the urban environment by dissipating high levels of radiation. The overall environmental cooling effect of turfgrass can be understood by comparing it to air conditioning. The front lawns of eight average houses have the same cooling effect as 24 (3-4 ton capacity) home central air conditioning units. (2, 3, 5)

Sources:

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3 - Kansas State University - Benefits of Healthy Turfgrass - https://www.bookstore.ksre.ksu.edu/pubs/MF2940.pdf

4 - Recommendation of the Expert Panel to Define Removal Rates for Urban Nutrient Management - http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2015/03/CBP-APPROVED-FINAL-UNM-EXPERT-PANEL-REPORT-032514_SHORT.pdf

5 - Brigham Young University - Synthetic Surface Heat Studies

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