Lawn life

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What does the term "lawn life" make you think about when you hear it? Is it children playing, families gathering, or just you relaxing barefooted? For many of us, it is all three. There is no doubt that turf lawns provide outdoor spaces for everyone to enjoy, and that private time outdoors has never been more important than it is right now with families confined at home due to the ongoing Covid-19 pandemic.

However, nostalgic memories of spending time with loved ones outdoors shouldn't be the only thing that comes to mind. There is another lawn "life" that exists right beneath your feet. This life just happens to be going on quietly underground while families and kids enjoy all that turf lawns have to offer on the surface.

The life that I am referring to is the living, thriving, and yes, breathing abundance of life that lawns support beneath the surface. From plant and soil processes to arthropods and micro-organisms, turf lawns sustain a wide range of life in urban and suburban neighborhoods all over the world. TPI and The Lawn Institute have been digging through recent scientific literature to help tell the story of the many benefits of the suburban lawn. It is a story of fresh oxygen, cooler environments, carbon capture, and thriving ecosystems just to name a few. A fundamental understanding of how each of these are tied together are key to understanding this important component of urban and suburban life.

Plants produce fresh oxygen through photosynthesis. This is the process of plants capturing atmospheric carbon dioxide through the leaves and combining it with water and sunlight to produce not only food for the plant, but oxygen as a by-product. TPI and The Lawn Institute just recently funded a research project on turf oxygen production for various cities throughout the world, including Australia. This research used local weather data in 31 cities worldwide, including 5 in Australia, and found that a 200 square metre turf lawn can produce enough oxygen for between 12 and 18 people in Adelaide, Brisbane, Melbourne, Perth, and Sydney. So, next time you're outdoors on turf and feel like you get a nice fresh breath of air from it… you actually do! Data on turf oxygen production was also calculated for cities in the United States, Europe, and Canada and will be released in the near future to illustrate one of the many un-seen benefits of lawns in suburban cities worldwide.

As mentioned above, one of the basic inputs in the photosynthetic process is atmospheric carbon dioxide. This is the source of carbon that is later converted into sugars and carbohydrates for plant growth. As plants extract carbon dioxide from the atmosphere, they sequester in above and below-ground tissues where it can serve many purposes. First and foremost, it gets it out of the atmosphere and as such, turf lawns serve as an important sink for carbon in developed cities. Turf lawns exhibit an enormous rate of carbon sequestration in their first 25-30 years after establishment and several research studies have reported that residential lawns can store up to twice the amount of organic carbon beneath them than can agricultural soils. One research study reports that turf lawns can sequester more than 3 tons of carbon per hectare per year, and another study reports that in the United States, urban grasslands can capture the carbon equivalent of 3.9 million cars annually.

The benefits of carbon capture by turf lawns do not stop there. This carbon is deposited into the soil where it contributes to soil organic carbon and can have a profound influence on ecosystem sustainability, soil fertility, and soil structure. Urban and suburban cities in many areas of the world are often developed on agricultural land. As neighborhoods are developed, hundreds of years of organic carbon deposited by plants are stripped off during construction practices so that homes and roads can be built onto the underlying mineral subsoils. Planting turf lawns, trees, shrubs, and other plants are the most effective way to return these disturbed soils into a more native state. The carbon deposited by these plants improves soil structure and aggregation, creates pore space for water and oxygen, improves runoff capture, and serves as a habitat for a thriving system of soil arthropods and micro-organisms.

Researchers in Australia illustrated this by evaluating arthropod species found in turf, leaf litter, woodchips, and bare ground over a 6 week period. Grass plots had the greatest diversity of both ants and beetles on 5 of the 6 sampling dates and had the greatest diversity at the taxonomic level order on half of the sampling dates. In all, 21 orders of arthropods were collected from four turf sites. This research also indicates that after turf is established, arthropods invade quite quickly, often within months. These trends are supported by other research worldwide and in a study in Canada, the researchers state that turf lawn ecosystems made up of perennial grass species, even when intensively managed, support a diverse fauna of arthropods including herbivores, natural enemies and decomposers. This is further supported by researchers in the United States who in one study found over 330,000 arthropods in 20 home lawns within a 3-month sampling period.

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Going even further, researchers evaluating the soil microbiome see similar trends. The soil microbiome is made up of a complex network of micro-organisms including bacteria, fungi, and single-celled organisms called archaea and recent research has shown that turf lawn establishment enhances soil microbial diversity when compared to bare soil and it helps regulate microbial community composition. These micro-organisms are vital to soil health and sustainability and are supported by the high carbon sequestration rates of the turf they flourish under. There is little doubt that soils beneath turf, even in managed lawns, support a thriving ecosystem of soil arthropods and microbes as well as a complex interaction of soil and plant processes that provide many more benefits than just a place for kids to play.

TPI and The Lawn Institute have spent the last two years funding these types of reviews of scientific literature and will be sharing much of it on a new website in February of 2021.

Be sure to check out www.TheLawnInstitute.org to learn more about the many environmental benefits of urban and suburban lawns. Follow us on Facebook and Twitter for shareable social media graphics, handouts, lawn facts, and more to help tell the full story of turf lawns worldwide.