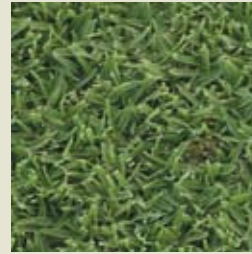
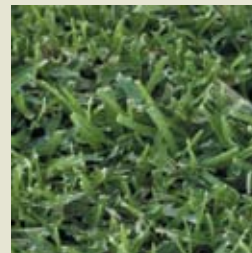
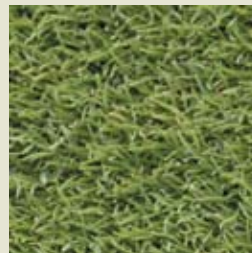
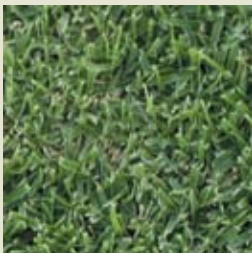
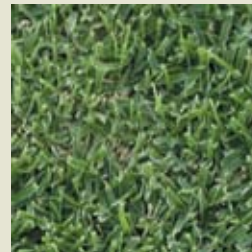
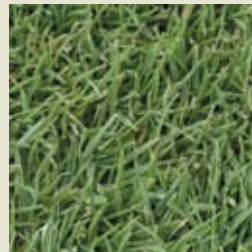




Life is Short. Sod it!



*Artificial Turf:  
Separating Fact  
from Fiction*



A RESOURCE FOR TURF PROFESSIONALS IN DECIDING  
BETWEEN ARTIFICIAL AND NATURAL TURF

# A Resource For Turf Professionals In Deciding Between Artificial And Natural Turf

## “If Something Sounds Too Good To Be True, Then It Probably Is.”

No longer considered to be an exorbitant cost for only those with the deepest pockets, artificial turf's use has grown in popularity so that high schools, municipalities and even corporate campuses are installing the high-priced surfaces. But as the use of artificial turf has grown, so have the misconceptions of the benefits associated with the synthetic surface.

Touted for its low-maintenance costs, studies have shown that artificial turf can, in actuality, cost more in upkeep and maintenance than natural turf. Environmentally, synthetic turf can help reduce water consumption to a degree in comparison to some of the older, thirstier turf grass varieties—but at the price of releasing dangerous toxins (from broken-down ground tire rubber) into the air. Studies have also shown that hardness levels found on artificial sports turf have contributed to recurring player injuries and shortened many professional athletic careers, explaining why hundreds of professional sports players polled said they preferred playing on natural turf. From difficulties in sanitizing the field to exposing players to dangerously elevated heat levels, artificial turf has proven to be a product that hasn't lived up to its promises.

As a sod producer, West Coast Turf obviously is predisposed to natural turf. However, there is a growing body of objective evidence that supports the premise that natural turf is a more cost-effective solution. The evidence has also shown that natural turf is better for athletes and has environmental advantages beyond the playing field. Before making a decision on what type of surface is best for your clients, consider authoritative information regarding the use of artificial turf to separate the hard facts from the popular fiction.

## Fiction: Artificial Turf Will Save Money In Lower Maintenance Costs Over Time

**Fact:** It is generally accepted that the initial price of artificial turf is many times greater than a natural turf area. In one study, researchers reported that for every \$1 spent to construct the natural surface at Brigham Young University, the university spent \$11.77 to construct the synthetic turf surface.<sup>1</sup> To justify this expense, users are often dazzled by promises of lower maintenance costs over time. However, once the artificial turf has been installed and the invoices paid, users often find that the maintenance costs of artificial turf over time are equal to or higher than natural turf.

For example, at the University of Nebraska-Lincoln, new FieldTurf was installed in 2005 at a cost of approximately \$900,000. Officials have acknowledged that the field was expected to last only eight years. Then, it will need to be replaced at a cost equal to or higher than what the current field cost. In addition, maintenance for the FieldTurf was budgeted to be \$10,000 for each year. Amortizing these costs over the eight-year lifespan, the total amount for installation of the FieldTurf plus annual maintenance costs (not including inflation) would be \$122,500 per year. These costs are then repeated over the next eight years when new FieldTurf is installed. That's quite a difference compared to installing and maintaining a natural turf field as shown in a study by Dr. A.J. Powell, a leading turfgrass agronomist with the University of Kentucky. Compare the high cost of installation and annual maintenance at the University of Nebraska Lincoln with the approximately \$22,200 Dr. Powell found it costs per year to install and maintain a soil-based field.<sup>2</sup> (See charts on next page)

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<sup>1</sup> C. Frank Williams and Gilbert E. Pulley, "Synthetic Surface Heat Studies," Brigham Young University.

<sup>2</sup> Lynne Brakeman, "Natural vs. Synthetic Fields: Comparing the Costs," *Athletic Turf News*, March 21, 2005.

That's one reason Dr. Powell emphasizes that landscape architects should be mindful of all the costs associated with a synthetic field. Dr. Powell's research compared the costs of natural turf versus synthetic fields over a period of ten years. The study examined the costs of constructing and maintaining a new synthetic field that would need to be replaced at the end of the ten year period with the costs of installing and maintaining a soil- or sand-based field. Dr. Powell concluded that existing soil-based fields were the least expensive of all types of fields (i.e. soil, sand, infill) to establish and maintain.<sup>3</sup>

An item of note in Dr. Powell's research did conclude that installing and maintaining a sand-based field to be more expensive than installing and maintaining an infill system over the first ten years after installation. However, this cost then dropped to approximately \$46,000 per year in maintenance in subsequent years. After a ten year period, the infill system would require replacing and the cost of installation and maintenance amortized over the following ten years would remain in the hundreds of thousands of dollars per year.

### Installation and Maintenance Costs: New/Existing Natural-Based Turf

	New Soil-Based	New Sand-Based	Existing Sand-Based
Initial Construction	\$50,000	\$1,000,000	N/A
First-Year Maintenance Costs	\$15,000	\$40,000	\$40,000
10-Year Maintenance Costs	\$172,018*	\$458,600*	\$458,600*
10-Year Total Costs	\$222,018	\$1,458,600	\$458,600*
Average Cost Per Year	\$22,202	\$145,860	\$45,860

Source: "Natural vs. Synthetic Fields: Comparing the Costs," *Athletic Turf News*, March 21, 2005.

\* Annual Inflation 3%

### Installation and Maintenance Costs: Installing FieldTurf

	FieldTurf Installation
Initial Construction	\$900,000
First-Year Maintenance Costs	\$10,000
8-Year* Maintenance Costs	\$80,000**
8-Year Total Costs	\$980,000
Average Cost Per Year	\$122,500

\* Life expectancy: 8 years

\*\* Does not include inflation

<sup>3</sup> Lynne Brakeman, "Natural vs. Synthetic Fields: Comparing the Costs," *Athletic Turf News*, March 21, 2005.

Comparisons of the costs to install and maintain natural and artificial fields are consistent in other studies, as well. When comparing the installation and maintenance of new natural and artificial turfs at Springfield College in Springfield, Massachusetts, the average costs over an eight-year period were, again, much higher for the artificial turf. The study found that the cost of installing a natural turf field was \$400,000. The cost to maintain the field per year totaled \$28,000. The total cost to install and maintain the natural field (not including inflation) would be \$624,000, an average of \$78,000 per year.

Conversely, the study showed the cost to install an artificial field was \$800,000 with an average maintenance bill of \$5,000 per year. Even with lower maintenance costs per year, the annualized cost was \$105,000 per year. That's \$27,000 more per year than if a natural turf field had been installed.<sup>4</sup>

## Installation and Maintenance Costs: Installing New Natural Turf vs. New Artificial Turf

	Natural Turf	Artificial Turf
Cost to Install	\$400,000	\$800,000
Cost to Maintain Per Year	\$28,000	\$5,000
8-Year Maintenance Costs	\$224,000*	\$40,000*
8-Year Total Costs	\$624,000	\$840,000
Average Cost Per Year	\$78,000	\$105,000

Source: "Turf Wars," *Landscape Contractor National*, June 2005.

\*Does not include inflation

As these studies show, the belief that artificial turf means lower overall maintenance costs obviously needs careful inspection. Amy Fouty, CSFM, athletic turf manager for Michigan State University, considers the claims of low maintenance a myth to be debunked. Giving a presentation at a Michigan Sports Turf Managers Association meeting, Fouty explained that the total costs to maintain her artificial field were only \$22,760. However, her budget to purchase the synthetic turf maintenance equipment varied from \$8,250 to upwards of \$82,000. This was in addition to spending up to \$3,000 per day plus expenses for outside contractors to consult or train with staff on the artificial surface and spending \$30 to \$70 per linear foot for repairs.<sup>5</sup>

As the examples have shown, landscape architects must be aware that the promise of "no maintenance" does not hold when the hidden costs to keep the field in top condition plus the cost of ultimate replacement are figured in. Landscape architects must also be aware that "maintenance free" does not translate to lower costs over time when installing artificial turf. Charlie Coffin, sports field manager for the Detroit Lions, who play on a synthetic infill system at Ford Field, agreed with this point.

"We were sold these fields on the basis that there would be no maintenance," said Coffin. "That just wasn't true."<sup>6</sup>

## Fiction: Artificial Turf Is Safer To Play On

**Fact:** Today's artificial turf managers and coaches whose teams play on artificial turf are faced with managing a variety of safety issues that have profound effects on the wellbeing and health of athletes. These issues include field sanitation, heat factors and the inflexible nature of artificial turf's surface. The simple makeup and construction of artificial turf poses unique problems that, if not managed correctly, can have dire consequences for athletes that play on artificial surfaces.

<sup>4</sup>Erik Skindrud, "Turf Wars: How do grass and artificial turf compare?" *Landscape Contractor National*, June 2005.

<sup>5</sup>Lynne Brakeman, "Experts spell out the true cost of synthetic turf maintenance," *Athletic Turf News*, May 24, 2005.

<sup>6</sup>Ibid.

## Sanitation

One safety issue is field cleanliness. After practices and athletic events, turf managers must properly sanitize the field using a variety of remedies to remove bodily fluids and/or animal droppings, such as on outdoor fields. Field sanitizing is done in order to ensure the safety of players since abrasive surfaces on artificial fields can result in difficult-to-heal injuries, particularly in the presence of bacterial or viral pathogens. Properly treating these wounds caused by the abrasive surfaces is imperative given the recent cases of near-fatal bacterial infections from injuries that have occurred on artificial fields. From high school athletes to professional players, no athlete has been immune from contracting infections caused from turf burns acquired while playing on artificial surfaces.

According to a study conducted by the Centers for Disease Control (CDC) in 2003, abrasive artificial turf was found to be the cause of several cases of near-fatal Methicillin-resistant Staphylococcus aureus (MRSA) infections in athletes. More often infecting the skin, heart or central nervous system of hospitalized patients, MRSA is a type of drug-resistant bacteria that has become increasingly common among healthy athletes because of frequent person-to-person contact. Researchers studying the outbreak of MRSA infections found that players who sustained turf burns on highly abrasive artificial turf fields were seven times more likely to contract an MRSA infection because, when left uncovered, the wounds caused by the artificial turf abrasions allowed the MRSA pathogen to be passed from one player to another in close contact.<sup>7</sup>

A team of CDC investigators tested the St. Louis Rams' practice facility during the 2003 season and swabbed the turf burns of players, testing for the bug. They found eight cases of MRSA among Rams' linemen along with some cases among members of the San Francisco 49ers who had picked it up from the St. Louis players when the teams played each other. The researchers determined that scrapes from the skin from artificial turf provided the entry point. The germ was then passed around in a number of ways such as sharing towels or using locker room facilities that weren't completely disinfected.<sup>8</sup>

MRSA has also been identified at the high-school level when ten football players at a Connecticut college contracted MRSA. Two of the players had to be hospitalized.<sup>9</sup> A 12-year-old spent five weeks in Texas Children's Hospital in Houston after a scraped shoulder suffered in football practice turned into an MRSA infection that spread to his lungs.<sup>10</sup> Ron Courson, head athletic trainer at the University of Georgia, has seen how effortlessly a turf burn can turn deadly.

"An athlete has a cut or an abrasion that we bandage," Courson said. "As he comes off the practice field and is in the locker room or in the shower, he takes that bandage off and throws it on the ground. Then someone in bare feet steps on it. It can happen that easily."<sup>11</sup>

## Heat

A second issue impacting the safety and well-being of athletes is the high surface temperatures that can be reached on artificial fields. Temperatures on artificial fields have been documented to be upwards of 86.5 degrees hotter than natural grass fields under identical conditions.<sup>12</sup> Determining how long players of all ages can be safely exposed to this level of heat is another issue turf managers must consider when installing artificial turf.

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<sup>7</sup> "Drug-resistant bacterial infections on a college football team traced to body shaving and artificial turf burns," *Athletic Turf*, December 1, 2004.

<sup>8</sup> Phil Taylor, "A Menace in the Locker Room," *SL.com*, February 23, 2005.

<sup>9</sup> "Drug-resistant bacterial infections on a college football team traced to body shaving and artificial turf burns," *Athletic Turf*, December 1, 2004.

<sup>10</sup> Taylor, "A Menace in the Locker Room," *SL.com*, February 23, 2005.

<sup>11</sup> *Ibid.*

<sup>12</sup> C. Frank Williams, Gilbert E. Pulley, "Synthetic Surface Heat Studies," Brigham Young University.

Researchers at Brigham Young University conducted studies on how hot artificial fields can get. Not surprisingly, the researchers found that surface temperatures of artificial turf are significantly higher than surface temperatures of natural turf.

Using an infrared thermometer, the researchers took surface temperature readings of asphalt and surface readings on both synthetic and natural turfs. The researchers found that, on a day with an average temperature of 81 degrees Fahrenheit, the surface temperature of the synthetic turf was 37 degrees higher than asphalt and 86.5 degrees hotter than natural grass fields. Two inches below the synthetic turf surface, temperatures were 28.5 degrees hotter than natural turf at the surface.

Irrigation of the synthetic turf had a significant result cooling the surface from 174 degrees to 85 degrees. However, after five minutes the temperature rebounded to 120 degrees. The temperature rebounded to 164 degrees after only 20 minutes.<sup>13</sup> The researchers pointed out that, when temperatures reach 122 degrees, it takes less than 10 minutes to cause injury to skin, further jeopardizing the safety of players.

## Unyielding Surfaces

A third safety issue landscape architects should be mindful of when installing artificial surfaces is that field hardness on artificial surfaces can result in serious chronic or immediate athletic injury. In a five-year prospective study that evaluated eight high schools, researchers compared athletes injuries on natural turf to injuries on FieldTurf, researchers found there was a higher incidence of surface to skin injuries and muscle strains and spasm on FieldTurf.<sup>14</sup> Of every ten games played, athletes incurred injuries 15.2 percent of the time with FieldTurf versus 13.9 percent of the time with natural surfaces.<sup>15</sup>

Many athletes also agree that there is a higher incidence of injury on artificial surfaces in comparison to natural surfaces. In a survey conducted by the National Football League Players Association, 1,514 active NFL players were asked for their input on natural versus artificial turf. Of the players who responded, 91.2 percent thought that artificial turf would be more likely to contribute to injury. Of these professional athletes, 96.4 percent also thought that artificial turf caused more soreness and fatigue when played on.<sup>16</sup>

NFL players were also consistent in their thoughts that artificial turf was more likely to shorten their careers (85.9 percent) and was more likely to affect their quality of life after football (87.4 percent). Of those athletes that have experienced injuries on artificial turf, over 41 percent of respondents thought that their injuries would not have occurred on natural turf compared to 22 percent of respondents who thought their injuries would have occurred on natural turf.<sup>17</sup>

Some players have become more outspoken regarding the hazards of playing on artificial surfaces. Sidelined for most of 2003 for a partial tear in his right shoulder when he fell on the artificial surface at Tropicana Field, Anaheim Angels' Troy Glaus was again injured when he took a dive on Minneapolis' Metrodome's artificial field in 2004.

“When you dive, your glove should not stick on the ground,” a perturbed Glaus said. “That doesn’t happen on dirt and it didn’t happen on the old turf here. This is one of those things that shouldn’t have happened.”

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<sup>13</sup> Ibid.

<sup>14</sup> Lynne Brakeman, “Study compares high school athlete injuries and natural turf and FieldTurf,” *Athletic Turf*, October 27, 2004.

<sup>15</sup> Michael Myers, Bill Barnhill, “Incidence, causes and severity of high school football injuries of FieldTurf versus natural grass; a 5-year prospective study,” *American Journal of Sports Medicine*, October-November, 2004, 32, 1626-38.

<sup>16</sup> National Football League Players Association, “NFL Players Playing Surfaces Opinion Survey,” *NFLPA*, 2004.

<sup>17</sup> Ibid.

Glaus continued, “You can’t simulate grass. No matter what you do, you can’t fake it.... This stuff has hard spots, soft spots, sometimes your cleats stick to it, and sometimes you slip. It’s not good to play on.”<sup>18</sup>

## **Fiction: Players Prefer Artificial Turf**

**Fact:** Given the negative impact on athletes’ health and well-being, the fact of the matter is, professional athletes simply prefer to play on natural turf. In the survey conducted by the NFLPA, an overwhelming 85 percent of over 1,500 professional football players said they preferred to play on natural turf. Baseball players agree. Now head baseball coach at Calabasas, California high school, Bret Saberhagen once told a crowd gathered for a fund-raising campaign agreed that natural fields are best for athletes.

“In the majors we used to dread going on the road to play on an artificial field,” Saberhagen said. “There’s no way I would consider one for my kids. Baseball was meant to be played on grass.”

Mike McFaul of First and Goal, Inc., the parent company of Seattle’s Qwest Field, said Elite soccer clubs also balk at playing on artificial surfaces.

“We haven’t been able to convince the top international teams to play on anything but grass,” said McFaul. “So on three separate occasions, we’ve enlisted the help of West Coast Turf to create a grass field over our existing in-fill surface.”

The proof of players preferences are in the numbers. In the NFLPA poll, NFL players were asked to rank the best three and the worst three playing fields in the NFL. Results showed that the top four fields all had natural turf:

- Tampa Bay Buccaneers’ Raymond James Stadium
- Carolina Panthers’ Bank of America Stadium
- Arizona Cardinals’ Sun Devil Stadium
- Houston Texans’ Reliant Stadium.<sup>19</sup>

Of the top ten best-rated fields, six were natural turf (which also included Jacksonville Jaguars’ Alltel Stadium and Philadelphia Eagles’ Lincoln Financial Field).<sup>20</sup>

Seven of the ten worst fields all contained artificial turf with AstroTurf and FieldTurf surfaces leading the pack:

- Indianapolis Colts’ RCA Dome (AstroTurf)
- St. Louis Rams’ Edward Jones Dome (AstroTurf)
- Minnesota Vikings’ Metrodome (FieldTurf)
- New York Giants’/Jets’ Giant Stadium (FieldTurf)
- Cincinnati Bengals’ Paul Brown Stadium (FieldTurf)
- New Orleans Saints’ Superdome
- Dallas Cowboys’ Texas Stadium<sup>21</sup>

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<sup>18</sup> Mike DiGiovanna, No Surface Charm to Angel Loss; Glaus criticizes turf at Metrodome....,” *LA Times*, May 1, 2004, Page D1.

<sup>19</sup> National Football League Players Association, “NFL Players Playing Surfaces Opinion Survey,” *NFLPA*, 2004.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

The numbers signifying players' preferences for natural turf also apply to professional baseball players. In a Sports Illustrated poll, the top fields preferred by MLB players are natural turf fields. In fact, only five of 525 votes were cast for ballparks with artificial turf.<sup>22</sup>

Currently, professional baseball players would be hard-pressed to find any games played on artificial turf. There are no more National League stadiums that have artificial turf and only three American League stadiums have artificial turf: Toronto Blue Jays' Rogers Center, Minnesota Twins' Metrodome and Tampa Bay Devil Rays' Tropicana Field. To Mets' Manager Willie Randolph, the disappearance of artificial turf is a welcome sign.

"It's baseball the way it's supposed to be played," said Randolph. "I've never been a fan of artificial surfaces. A guy makes a good pitch and the ball squirts through a hole—that's not baseball."<sup>23</sup>

## **Fiction: Artificial Turf Is More Environmentally Responsible**

**Fact:** Many landscape architects are finding that the environmental benefits of natural turf far outweigh those of artificial turf. Ground rubber tires are used in some artificial fields yet, because of their toxic content, they are prohibited from being disposed of in landfills or oceans. Landscape managers must consider where this toxic material will be disposed when a replacement field becomes necessary.

Already considering these concerns, Turfgrass Producers International (TPI), an association of companies in the sod production industry, brought these environmental issues to the Environmental Protection Agency in late 2004. Citing concerns of human exposure to silica dust (from silica sand) and cadmium particles (from ground tire rubber), which make up the construction of artificial turf, TPI requested the EPA to establish maximum exposure levels to the materials.<sup>24</sup>

In addition to toxicity issues, research has found that artificial turf consumes and wastes energy. However, TPI also brought forth facts regarding the benefits natural turf has on the environment. These benefits included:

- **Pollution control:** Turfgrass traps and removes dust and dirt from the air.
- **Absorbs carbon dioxide:** 2,500 square feet of lawn absorb carbon dioxide from the atmosphere, and release enough oxygen for a family of four to breathe.
- **Cooling effect:** The front lawns of eight houses have the cooling effect of about 70 tons of air conditioning for the environment. To put this in perspective, the average home has an air conditioner with just a three or four ton capacity.
- **A natural filter:** Turfgrass acts as a natural water filter, reducing pollution by purifying the water passing through its root zone.
- **Prevents soil erosion:** A healthy, sodded lawn absorbs rainfall six times more effectively than a wheat field and four times better than a hay field.<sup>25</sup>

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<sup>22</sup> Sports Illustrated, July 7, 2003.

<sup>23</sup> Pat Borzi, "Grass is Back, Turf is Dying, Baseball Lives," *New York Times*, March 9, 2005, Section D, Page 1, Column 4.

<sup>24</sup> Stephen Kelly, "TPI Presents EPA with Concerns about Artificial Turf," *Landscape Online*, October 13, 2004.

<sup>25</sup> Turfgrass Producers International, "Turf Resource Center," <http://www.turfgrassod.org/trc/environment.html>.

The turf industry is aware of the harmful effects artificial turf can have on the environment and recognizes the perception from some populations that natural turf wastes the earth's resources. Over the past several years, the turf industry has been responsive to these concerns and has developed several species of natural turf that are available in water-conserving varieties. The turf industry has also developed strong partnerships with landscape architects to specify region-appropriate natural turf options that conserve water and are guaranteed to not harm the environment.

## **Conclusion**

The information in this paper has been compiled from a broad range of research to provide landscape architects with authoritative information on the many misconceptions associated with the installation of artificial turf. From players' preferences to cost efficiencies, a strong case can be made for why natural turf is simply better for your customers.

And the research continues. Many new varieties of grass are being developed and studied to ensure efficient water use while meeting the evolving needs of consumers, athletes and the environment. West Coast Turf can help you determine the best type of natural turf to best suit your specific locales, applications and budget parameters.

Weigh all the facts. We hope you come to a similar conclusion that the age-old adage has proven correct. The promises of artificial turf are simply too good to be true.

**For more information, please call Danielle Marman at 800-447-1840 or e-mail her at [danielle@westcoastturf.com](mailto:danielle@westcoastturf.com).**