WHY INOCULATE?

Regular inoculation of the soil with Plant Growth Promoting Rhizobacteria (PGPR) allows the indigenous (beneficial bacteria) population of microorganisms to be replenished and remain at a higher level of activity on a continuous basis.

There is intense competition among organisms for available food, nutrients and oxygen. Survival depends upon the organism's ability to uptake nutrients, metabolize food and reproduce. When the beneficial microbes are predominate, they deprive pathogenic, disease-causing organisms of living space. Beneficial microbes (our PGPR inoculants) will always out-compete the water and soil-borne pathogens for the available resources when in a dominate position and do not assimilate on any living plant form. When they run out of a food source, they die creating a food source for other microbes and plant life. Pathogenic microbes (Bad guys) can only feed on single cell sources and PGPR (beneficial bacteria) can assimilate both simple and multiple celled items. This is why PGPR can outperform and dominate the rhizosphere given the opportunity. A good example in turf is when a weak plant continues to form amino acids trying to survive, but is not able to transfer the process into complex proteins, thus allowing the plant to actually leak amino acids (single cell) that can support a pathogen attack. Providing the elements necessary for increased plant health results in stronger cell walls reducing this leaking potential and providing the necessary food source through the plant exudes for a symbiotic relationship of plant and microbes. It becomes the "chicken or the egg". External inoculation of beneficial microbes provides an insurance policy and/or raises the level of activity immediately, while not depending on environmental forces in the rhizosphere to raise the native population to a required level.

In addition to reducing pathogen growth, increasing the microbial population helps in other ways. More beneficial microbes help convert insoluble minerals into soluble form that can be readily utilized by the plant and increase nutrient uptake. What they eat (assimilate) is what they become and when they die they mineralize back into the soil solution. Excessive heat, cold, and lack of moisture will reduce the indigenous population. Regular inoculation will compensate for those organisms lost to weather and stress, while increasing the tolerance of the turf to weather extremes. These extremes are mitigated by the mere respiration and organism cell temperature, a 7 degree temperature swing can be expected with an acceptable population versus a lower level of activity. Lastly, increased microbial activity speeds up the digestion of residual organic material such as thatch, pesticides and other potential toxins. They prefer carbon and after assimilating the carbon bond in chemicals and hydrocarbons, the compounds become inert and the resulting CO_2 will be released to benefit the turf's canopy and necessary for solublizing calcium.

Regular inoculation using the **Quantum Yield Program** can provide the opportunities for a reduction of inputs of both fertility and chemical controls through a realized increase with observable plant health by the course superintendent.