

## Maintaining Carbohydrate Levels

Maintaining photosynthesis and adequate production of carbohydrates is essential for turf health and survival, particularly during stress periods.

During photosynthesis, green leaves capture solar energy and convert it to chemical energy. By fixing this chemical energy with carbon dioxide ( $\text{CO}_2$ ) and water ( $\text{H}_2\text{O}$ ), the plant creates carbohydrates that can be stored for later use. The plant uses respiration to break these chemical bonds apart, releasing the energy stored during photosynthesis. Both of these processes are sensitive to fluctuations in temperature and water availability.

25% to 75% of all daily carbohydrate production is consumed that same day, depending on turf species and current conditions. Any carbohydrates that aren't immediately needed by the plant are stored for later use.

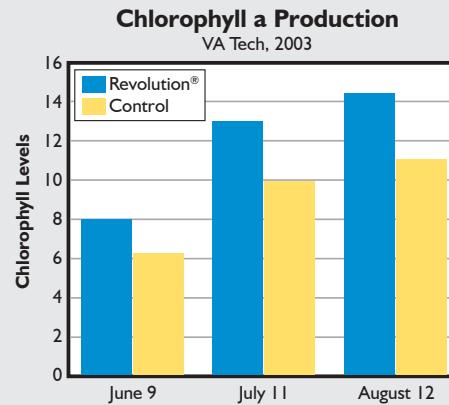
Maintaining a positive carbohydrate balance is essential for plant health; it supplies extra energy for plant growth without interfering with daily energy needs, and also acts as an energy reserve for periods when carbohydrate consumption exceeds daily production. The greater the reserve of carbohydrates, the longer the plant can survive adverse conditions.

When temperatures are cooler and water is readily available, cool-season turfgrasses produce more carbohydrates than are consumed and the plant runs a carbohydrate surplus. However, as temperatures rise the efficiency of photosynthesis declines while respiration rates rapidly increase, causing the turf to consume more carbohydrates than it can produce. In this situation, the plant runs a carbohydrate deficit and it must tap into its reserves in the crown and roots. Once stored carbohydrates are depleted, the turf will fall into decline and may die from starvation if the carbohydrate deficit persists.

Revolution® helps you keep water accessible during stress periods and maximize conditions for carbohy-

drate production. By creating a thin, continuous film of water, Revolution promotes the homogeneous distribution of water and air into pore spaces, making them instantly accessible to roots. By providing better moisture access and gas exchange, Revolution keeps water moving consistently to the plant, increasing photosynthetic efficiency and mitigating the effects of heat and drought stress that can cause carbohydrate depletion. By improving water access, it also keeps leaf turgor stable for increased photosynthetic efficiency and maintains evapotranspiration rates to keep the turf canopy cooler in the heat of day, and boosts the efficiency of other cellular processes for overall plant health.

### Keep the "Green Machine" Running at Full Speed



Revolution helps you maintain consistent color all season long, even under stress. Chlorophyll a, the pigment responsible for that unmistakable green, is significantly higher in turf treated with Revolution. Higher chlorophyll levels mean better turf color without the luxuriant growth normally associated with "greening" products such as nitrogen. It also contributes to more efficient photosynthesis and better production of carbohydrates that function as an energy reserve to keep turf healthy under stress.