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**Turfgrass Cultivars.** Over the years turfgrass breeding has emphasized improved turfgrass characteristics including density, low growth habit, and finer leaf texture. Subsequently, emphasis was placed on developing disease resistant cultivars. Now increased emphasis needs to be placed on such environmental stress problems as drought resistance, low water use, heat tolerance, cold tolerance, wear tolerance and shade adaptation. By providing these characteristics, turfs can be sustained at a more healthy level, which results in less proneness to insect and disease attacks and lower pesticide usage. This is because the pests that attack turfgrasses are relatively weak and thus tend to cause the most damage when the turf has been weakened by another factor such as environmental stress.

**Root Zone Stabilization.** Sports fields encompassing team sports, golf, and horse racing face ever increasing intensities of use. To avoid the compaction problem, high-sand root zones are being employed more commonly. The use of interlocking matrix stabilization techniques will play a substantial role in reducing turf damage and enhancing the root zone environment to provide acceptable turf quality under these conditions.

**Employees.** Employee safety and training programs need to be focused on (a) new employee orientation and monitoring, (b) continuing in-service training, (c) proper use of safety apparel, (d) use of appropriate safety devices on equipment, (e) following right-to-know guidelines, (f) training key employees in emergency first aid and CPR, and (g) development of an "operations manual" to be provided to each employee for regular reference.

**Energy.** Efficiency in energy utilization will be an on-going concern. Even though energy is not receiving the attention of a few years ago, it remains an issue that we must address.

Efficiencies are a key through (a) improved equipment design and fuel efficiency, (b) cultivars with a slower leaf extension rate that require less frequent mowing, (c) cultivars with a lower nitrogen requirement to minimize the vertical shoot growth rate that dictates more frequent mowing, and (d) lower pressure irrigation systems that reduce energy pumping costs.

**Summary.** There will be an ever increasing demand for turfgrass managers with sound technical expertise based on both a formal education and real-world field experience. These turf managers will face an increasing demand to perform management skills such as system organization, personnel management, record keeping, accounting, cost control, purchasing, and budgeting. The key to our future is sound knowledge-based applications to turf field operations and office management with emphasis on energy, water, pesticide, fertilizer, root zone, equipment, and labor efficiencies. This will in turn maximize cost efficiencies while producing high quality, functional turfs that are being subjected to ever increasing intensities of use.

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#### UPCOMING JB VISITATIONS:

Provided for Institute Affiliates who might wish to request a visitation when I'm nearby.

- March 22 to 26 - Saint John, New Brunswick, Canada.
- April 26 to May 4 - Singapore and Hong Kong.
- May 16 to 17 - New York, N.Y.
- May 20 to 29 - Southern Europe, Italy, Germany and France.
- June 14 to 22 - Western Oregon, USA.
- June 28 to 30 - Kansas City, Missouri, USA.
- July 17 to 25 - Palm Beach, Florida, USA.