GRAU'S Answers to Turf Questions

By FRED V. GRAU

Summer brings accelerated activity on all sports turf and, simultaneously, environmental conditions that are less than conducive to growth that compensates for traffic wear and tear. Dry heat rapidly draws water out of living tissues, plant and animal, which must be replaced if the organism is to survive. Mechanisms of protection vary widely and uniquely.

Man is limited to imbibing water to replace dehydration losses. When potable water is limited or non-existent (Mexico, Spring 1967) people die.

Some toads regularly experience heat and drought. They survive by burying themselves in the bottom of pools (aestivation). The pools become dry and parched. When rain falls months later, the toads emerge resuscitated.

Grasses have various devices to survive periods of dry heat. Zoysia has hairs on the upper side of the blades which deflect air currents. As drought and heat continue the leaves roll tightly (look like fescue leaves) to prevent water loss. Water dramatically refreshes the turf within a few minutes.

Bermudagrass has underground storage organs that sustain life (not growth) over long periods. U-3 bermudagrass in California survived for 75 days without irrigation in 100-degree heat. Roots were measured to 6 feet in depth.

Bluegrass enters dormancy under stress and survives on stored reserves of food in rhizomes. Irrigation can break the dormancy and, unfortunately, can deplete food reserves which weakens the turf and renders it more susceptible to winter injury and weed invasion.

Bentgrasses are wide open to devastation by heat and dessication. They seem to possess few devices for preservation. Man, therefore, must irrigate frequently to maintain a high content of water in the tissues of these grasses.

Fescues have thin blades which are able to roll thinner and tighter to reduce water loss. Tall fescues have astounding ability to survive long periods of dry searing heat and to recover quickly when moisture is supplied.

Heat with high humidity—This situation can and does occur during periods of dry heat. Water applied frequently and in great excess produces highly undesirable conditions of high humidity in the microclimate. At this point, diseases that flourish in heat and humidity begin to run rampant, creating the need to treat with chemicals that have the power to stop grass growth, too.

Water reduces temperature by evaporation when relative humidity permits. The benefits of *cooling* easily can be offset by the choking effect of excess water that fills soil pores and smothers roots.

Ideally, grass grows best under conditions of alternate wetting and drying which favors *granulation* and free exchange of gases, together with rapid infiltration and percolation.

Temperatures we must endure with little chance of alteration; moisture can be completely under our control. In the discipline of turfgrass we are far from an understanding of the true relationship between the growth and well-being of grass and the complex systems of soils, fertility, and water. **continued on page 72**

Grau's Answers

continued from page 10

It is incumbent on all of us to direct our efforts toward: 1) grasses that tolerate excesses of all kinds with impunity; 2) the judicious use of minimum quantities of water, consistent with good playing conditions, and 3) fertilizer programs that enhance our objectives.

The turfgrass industry desperately needs basic research to learn the *why* of things. We can not go much further in industry-supported "demonstration testing" of trade-name materials. Turfgrass in stress affects a very high percentage of U.S. taxpayers. Concerted effort is needed to direct tax dollars to the universal discipline of turf.

Q.—We have been told that our turf will take wear and tear better and suffer less in hot weather if potash levels are kept high. Why is this, if it is true? (West Virginia)

A.—It is true. Potash is very important in the translocation of sugars in the plant which are manufactured during daylight. At night they are transported to storage organs and are converted to carbohydrates. Low potash means sluggish movement which could result in partial starvation of the turf.

Potash also helps to stiffen cell walls which gives turfgrass leaves more resistance to traffic.

Disease resistance is another factor in favor of keeping potash levels adequate. A rule of thumb is to use about one-half to two-thirds as much potash as nitrogen. Twelve pounds of N would call for six to eight pounds of K during the season.

Potash is soluble and can be leached with high rainfall and heavy irrigation. Use it in light frequent applications.

Q.—At our local meetings we argue over whether to raise our mowers in the summer or to keep them set at the most desirable playing height and just skip a mowing now and then when the turf seems "tired." What is your opinion? (New Jersey)

A.—We favor the policy of maintain-