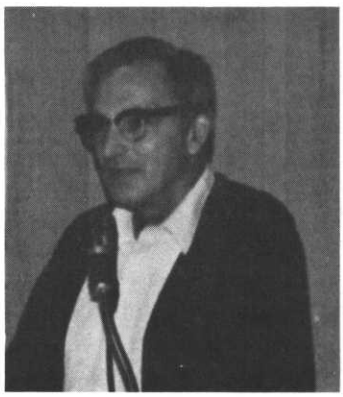
SOME ECOLOGICAL PRINCIPLES OF TURF MANAGEMENT



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It is often useful to take a non-traditional view of our turf situations. A new perspective often results in some new ideas. My objective is to apply ecological principles to turf management that may give some insights into why things happen in the turfgrass community. I've added a few principles to my list and hope that they are useful to you as guideposts in examining problems and developing programs.

1. The first principle is really a definition. It is my definition of Turf Management: "Turf management is the management of competition between desirable (turfgrasses, trees, etc.) and undesirable (weeds, etc.) vegetation".

This says we manage our turf to favor the plants we want while penalizing the plants we don't want. Mowing, for instance, favors turfgrasses while penalizing young woody plants and most coarse weeds that can't tolerate decapitation.

The other principles are not definitions and are described below.

2. "All plants are different in response to the major growth factors (light, water, nutrients, air) and mowing".

The differences allow us the opportunity to manage the competition. Another example with mowing is that most turfgrasses respond to regular mowing in a way that increases the population of tillers. The turf becomes more dense, capturing more light and crowding out or not allowing other plants to become established.

3. "There is an optimum set of conditions when considering the major growth factors, under which any plant type will be most productive and competitive".

If we can discern the optimum level for light, water, nutrients, soil, air, mowing, etc., for the plants we desire and maintain these conditions, then our turf will always be functioning at the best level of quality. An important note here is that optimum is not meant to be maximum. A maximum condition can only be maintained briefly and then a recovery period is required to bring things back to a sustainable condition (which some might call normal). It is something like running as fast as you can for as long as you can. The longer you run, the longer it takes to recover and catch your breath. Optimum means the best or most favorable condition for continued reproducible performance. The lesson for us is that if we drive our turf as hard as it can go (say by mowing as close as possible) it will sooner or later fail and the harder it has been driven (the closer it has been mowed) the longer it will take to recover.

4. "There are limits of tolerance related to conditions under which turf can grow".

Shade and non-shade tolerant grasses offer an example. There is a minimum amount of light under which 'Baron' Kentucky bluegrass can maintain competitive growth. If the minimum is exceeded, 'Baron' will not be able to compete with say 'Glade' which (is different) utilizes light more efficiently and tolerates lower light levels. Another example is that elite type Kentucky bluegrasses tolerate a lower mowing height than common Kentucky bluegrasses. Lower the height of cut and you eliminate the "Common" types. Lower it some more and you eliminate the "Elite" types and end up with poa annua or bentgrass.

5. "There are interactions between growth factors and we must realize that when we change one condition we change them all".
An example might be if we increase irrigation, we increase leaching potential (interaction of water with nutrients) and decrease air in the soil (interaction with

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oxygen and soil) and can change the pH, etc. The more we understand interactions the easier it will be to manage turfgrasses.

6. "There is an accumulation affect associated with constant or regular treatment applications".

If we constantly mow elite Kentucky bluegrasses at the normal height for common Kentucky bluegrass, the effect will likely be to accumulate excessive organic matter, thatch. If we continually apply lime when it is not needed it will accumulate a higher pH which may lead to reduced availability of some nutrients. If we regularly mow a putting green at the lower limit of tolerance, the effect will likely be to accumulate a continuing reduction in not only top growth, but also root growth and consequently accumulate an increased susceptability to drought and wear damage.

7. "One shot treatments do not accumulate affects but tend to move things off center only briefly. Usually the tendency is for the situation to return to the original condition".

It is comforting to remember that nature is forgiving in many ways (just don't make the same mistake twice) and grass often grows in spite of us. Application of this principle allows us, for example, to mow shorter than is desired occassionally, say for overseeding, without doing a great deal of lasting damage. Conversely we must realize that in order to really change things we usually need to establish a program for continuing application of the change factor.

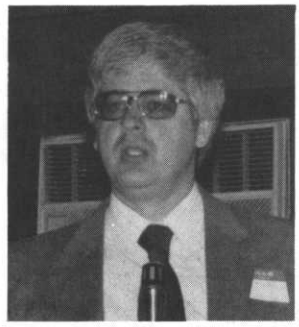
8. "When things are not going right, an effective strategy is to identify the factor or condition furthest from the optimum and correct it first".

This is a very important principle because it adds incentive to learn the others and occassionally allows us to perform seemingly magical things. The reason is that all factors interact and when the furthest from the optimum is corrected it usually interacts to shift responses to all the other factors closer to the optimum.

There are several more principles that are applicable to turf management situations. Maybe the best one to end with is 9) "If things are working well, don't fix them".

Best wishes for a good year in turf.

SOME COMMENTS ON THE SPRING OF 1984



by Dr. Donald White and
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This has been (still is for that matter) another typical Minnesota winter unlike any of the other recent ones.

Snow before freeze-up meant little or no frost in the soil all winter long. Lots of snow covered the ground longer than in many other years. This is the second of the last three years we have experienced rain in a thunderstorm during February.

On December 1 Dr. Don Baker's records showed that the soil temperature at 1/2 inch was 38.2; at 8 inches it was 39.8; and at 16 inches it was 42.4°F. On February 15 the soil temperatures reported are 33.6°F at 1/2 inch; 33.3°F at 2 inches and 4 inches; 33.7°F at 8 inches; and 35°F at 16 inches. They recorded only 1 to 2 inches of frost during the severe cold spell in January but it did not stay long. Normally we have around 40 inches of frost at this time in February. It has been a very mild winter under all the snow setting us up for cold temperature diseases. Maybe more importantly, it has allowed the melt water to penetrate the soil so that we have had little or no free water on the surface. Checking the soil situation in several places myself, I found no frost or standing water. The melt water seems to be moving right into the soil and at 2 inches the soil temperatures varied from 33°F to 36°F in our readings.

Our cold tolerance evaluations show that Poa annua did not develop as much hardiness as expected. But it should tolerate normal spring situations. It does indicate that the longer we keep the snow cover the better it will be for the grass, particularly if

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