

## THE TURFGRASS ENVIRONMENT - WHAT IS ENVIRONMENTAL STRESS?

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The theme for this 42nd Annual Michigan Turfgrass Conference session is the turfgrass environment and environmental stress. First we should define some of the key terminology involved. Three terms that are sometimes used interchangeably and can be confused are climate, weather, and environment. Climate is the composite state of the atmosphere for a particular region over a period of many years and encompasses the weather variations. This contrasts with weather which is a condition of the atmosphere at a specific time and place. It involves a description of the conditions at a particular point in time in contrast to climate which involves an overall description of the long term environmental characteristics of the area. Finally, the environment is the aggregate of all surrounding conditions influencing the turf. Turfgrass culture involves manipulation of the environment in order to favor growth and development of the turfgrasses.

Over the period of a year turfs are subjected to numerous environmental stresses which we attempt to modify, minimize, or even prevent through our turfgrass cultural practices. Environmental stresses can be divided into three types: (1) atmospheric, (2) edaphic (soil), and (3) biotic (man-traffic). This session will be concerned primarily with the atmospheric types of environmental stress. The major environmental stresses that turfs may be subjected to include (a) heat, (b) scald, (c) low temperature, (d) drought (summer dormancy), (e) winter desiccation, (f) flooding, (g) shading, and (h) atmospheric pollutants. The first seven types of stress will be discussed during this morning session.

The professional turfman should become as knowledgeable as possible concerning environmental stresses. There are five major aspects with which he should be concerned. First, are the specific symptoms associated with turfgrass damage caused by each of the major types of environmental stress. Recognition is a very important prerequisite to determining the specific cause of damage so that the appropriate steps can be taken to correct it or to prevent it in the future.

The specific criteria that can be utilized in recognizing a particular type of environmental stress include the (a) time of year, (b) associated environmental conditions, (c) soil conditions including topography and drainage, and (d) particular turfgrass species or cultivar that has been affected.

Second he should have a clear understanding of the conditions that favor the eventual development of a specific type of stress. By knowing the conditions that favor a particular type of stress, he can be prepared in advance to take steps to enhance recovery through overseeding or reestablishment. He can also forwarn his membership or employers that

conditions are favorable for a particular type of stress and can outline to them ahead of time the particular steps that he is taking to minimize damage from these stresses. In this way, he will ensure his employers that he is on top of the situation. One should keep in mind that there are situations where no matter how good the professional turfman or how well he exercises his options in preventing environmental stress, there is still the potential under certain situations for a severe loss of turf to occur in spite of his efforts. This is due to the fact that we do not have turfgrass cultivars available which tolerate all types of environmental stress that may occur over a period of time.

Third, is an understanding of species and cultivar tolerances to each type of stress. One can then assess the particular stresses most likely to occur in a given situation and select the particular turfgrass species and cultivar most likely to survive in this situation.

Fourth, he should have an understanding of the cultural practices that can be utilized to minimize environmental stress. Basically this involves manipulation of (a) the environment surrounding the turf or (b) adjusting the physiological condition of the turfgrass plant so that it is more hardy and able to survive the environmental stress. Quite frequently this involves a reduction in the hydration level (water content) within the plant tissues and a reduction in the growth rate.

Finally, the fifth involves an understanding of the cultural practices that can be utilized to enhance recovery of the turf from each particular type of environmental stress. Depending on which type of stress has caused the damage, there are certain steps that can be taken to reduce the chance of further damage and enhance recovery of the surviving turfgrass plants.