

Raises the Average Temperature, and Increases the Length of Playing Season

The specific heat of water is much higher than that of soil. The greater the proportion of water a soil contains the more heat it requires to raise the temperature of the soil a given amount. The continual evaporation from the surface of a wet soil reduces the temperature or retards the increase in temperature. The heat applied to a given soil area is fairly constant, so that if this heat must be used up in evaporating water the temperature of the soil body is not raised.

Drainage removes the excess water from the soil, reducing the heat required for evaporation and causing the soil body to warm up more readily. As a result of this, a drained soil warms up much earlier in the spring, and so lengthens the growing season. This enables the greenkeeper to start his spring work earlier, which is especially valuable in a so-called "backward" spring. The growth of the grass upon drained land is greatly benefited by the high temperature that prevails on drained land in the spring and fall. Investigators have found that at a depth of seven or eight inches a drained soil is from 12 to 15 degrees warmer than an undrained soil of the same nature and in the same climate.

Reduces Heaving

It is often noted that posts and dandelions have been raised out of the ground during the winter. This heaving is due to the freezing of a wet soil. When water freezes it expands one-eleventh of its volume and in a saturated soil this expansion must be upward, the amount of the heaving depending upon the amount of water in the soil and the depth to which it is frozen. The same action tends to raise the roots of the grass out of the ground, as the soil settles back after thawing, more rapidly than the plant root. This heaving also breaking many of the small roots and is the actual cause of winter kill.

Reduces Erosion

In an undrained area all of the rainfall must either be absorbed by the soil or pass away over the surface. In a continued rainy season the soil soon becomes saturated after which all the rainfall must flow away over the surface. The particles of the saturated soil are easily displaced and carried away by the water.

In an underdrained area the soil has a greater water capacity and allows of a continual removal of the surplus water by the drains. This greatly reduces the amount of water which must pass away over the surface and thus reduces erosion. Underdrainage of slopes will often prove a profitable investment if installed for no purpose other than reducing or preventing erosion.

Surplus Water Not Used by Turf

Greenkeepers often remark that they do not need tile underdrainage, that their land has such a great amount of natural drainage that underdrainage is not needed. This is a great mistake. Remember tile underdrainage

is essential in both hilltop or rolling lands and in low lands. Tile underdrainage helps in time of wetness or drought, for the simple reason that it removes the surplus water that is a detriment but retains the water needed for the growing plants and supplies same in time of drought due to the capillary action.

Better drainage (1) makes lands dry up earlier in the spring and prevents water standing after rains; (2) warms the soil so that the season is lengthened in both spring and fall; (3) ventilates and increases air content of the soil so that organic matter is decomposed; (4) removes the injurious salts and acids; (5) favors a deep root development; (6) prevents winter kill; (7) prevents shrinkage and cracking of soils in periods of drought.

Growing Chewing's Fescue On Hard Clay Fairways

By FRANK ERMER, *Secretary*

Cleveland District Association of Greenkeepers

IN picking up the January issue of THE NATIONAL GREENKEEPER, one of the first articles that attracted my attention was one by Lyman Carrier on fescue grasses. In this he explained how true red fescue, or more commonly called Chewing's fescue, spreads by stolons into a close, fine mat.

I have had a little experience with fescue on our fairways, which were of very hard clay, and baked badly in summer. It was quite a task to get what Chewing's fescue we had to spread and fill in the bare and cuppy places you hear the golfer howl so much about while playing summer golf.

First of all I took a disc with blades set straight, and cut the fairway in three different directions, then top dressed with a good grade of screened compost. On top of this surface I seeded the poor spots with Chewing's fescue, mixed with a small quantity of red top.

As there were still plenty of bad cuppy places, I decided not to use any seed, but to try and force the fescue to spread over them. These spots I spread with well rotted manure, raking it in well to make a kind of mulch around the grass roots. With this treatment I now find the fescue making rapid strides in filling in the bare spots and living up to its reputation of making a fine, closely matted turf.

*George Sargent of Scioto Country Club,
Columbus, Ohio*

New Member

In joining the National Association, Mr. Sargent wrote President Morley, as follows:

"I wish to congratulate you upon your splendid work in founding this organization. Such work is definitely constructive, and holds a value few of us appreciate."

Mr. Sargent is now preparing an article for THE NATIONAL GREENKEEPER, from his long experience in greenkeeping.