

## **Evaluating a Forced-air System for Sand Based Creeping Bentgrass Putting Greens**

*David D. Minner, John E. Jordan, and Jeffrey J. Salmond*

Properly constructed sand based greens provide rapid internal drainage and resistance to compaction. Topdressing, coring, slicing, and hydrojetting are routinely used to maintain porosity and allow passive air movement into the root zone. Even with the best management, summer stress can lead to shallow roots that require frequent irrigation and green syringing. Eventually greens become too wet, diseases invade, and high canopy, mat, and root zone temperatures cause severe turf loss. Forced-air-subsurface-systems are a new concept that can directly effect root zone temperatures and aeration. It may also effect microbial activity. Root zone fungi and bacteria produce CO<sub>2</sub> and other gaseous by-products. We will investigate the by-products of microbial activity to determine if they have any effect on plant growth. Dr. Clint Hodges, our resident turfgrass pathologist, has measured ethylene and other light hydrocarbons in levels that cause a plant response. Forced-air systems actively pump air into the drainage system and through the sand root zone. It is proposed that cooler air, supported by ground temperature, can be used to reduce damaging high temperatures in the turf canopy and near the root zone surface. Preliminary research and observations indicate that certain components of the USGA Sand Green Specification are required for forced-air-subsurface-systems to function properly. Specifications that are especially important are a network of perforated drain lines, a 4-inch gravel layer, and a specialized sand root zone.

Our objective is to determine what effect subsurface-forced-air has on microbial activity, root zone temperature and moisture, root growth, turf appearance, dew formation, and dry spot.

Construction on the sand based putting green began in the fall of 1995 with completion in August, 1996. Final grading and seeding took place in September. Trenches were dug and completed in November to house the electricity for the forced-air machines. Plastic barriers between the plots will be installed in summer, 1997. Two SubAir™ commercial blowers are used to force air into the drain line and through the green profile. When the direction of air flow is reversed the same blowers are used to remove air and water from the green profile.

# SubAir/Heatway plot plan layout

