TILE DRAINAGE PROSPECTS FOR POLK COUNTY

Many misconceptions concerning the value of tile drainage prevail in Polk County and in many of the other counties of the Red River Valley. No general rule or universal rule concerning tile drainage can apply to a county with as diversified topography and soil conditions as prevail in this county. There is no question but what tile lines of adequate size can drain sloughs, ponds or small lakes, but having tile lines to carry off surface water from fields is an entirely different matter. In order for tile lines to carry off surface water from the spring run-off, open man-holes must be placed over the tile lines. Even then sedimentation pits should be made to prevent the silting of the tile lines. The chief advantage of a tile line is that of removing the excess gravitational water from the fields during the growing season. Inasmuch as field soils freeze to a depth of four or more feet, the tile lines are not operative for the early spring rains. In the Fargo clay and Fargo silty clay soils often, with the heavy clay sub-soils which dominate the prairie section of the valley rapid percolation of water does not continue even over the tile line when the heavy soils compact in the trench. To get a quick percolation of the water down to the tile line stratas of gravel, cinders or other coarse materials should be placed diagonally from the surface to the title line in all low spots over the lines. The typical clay subsoil has vertical cleavage and the lateral pull of gravitational water through the soil is very slow.

An extensive system of tile drainage was installed at the Northwest Experiment Station in 1908 in which 4" and 5" tile lines were spaced parallel to each other at distances of 50, 75, 100, 200, 250, 300 and 400 feet apart with outlets into an open ditch system. The greatest depth of the outlet ditch was seven feet at the northwest corner of the section where the outlet emptied into Judicial Ditch 60. Observation wells sunk to the level of the tile lines were placed between tile lines to determine the lateral pull of the gravitational water to the lines. The wells were sunk some fifteen years after the tile lines were installed which allowed time for drainage lines to be established to the tile. To summarize results we concluded that to effectively drain such soils that tile lines would have to be spaced some two rods apart, which would make the cost prohibitive. Studies were also made of kinds of tile, clay and cement types from different sources. Of the tile used at that time, the observations made after some twenty years in the soil disclosed the fact that the clay tile was more durable than the cement tile used in that experiment. It is my observation however that cement tile and culverts today, which are made with washed sand and gravel withstand the disintegrating action of our high lime soils. The same observation applies to all concrete construction which comes in contact with our high lime heavier soil types.

There are many small areas in Polk County that could be profitably tile drained, especially where earth barriers makes