

**A LITTLE BIT COUNTRY
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Trees Need Good Soil

As I was walking along the roadside this week I noticed a new blade of yellow/green grass emerging from the ground. For me, this was evidence the spring season is indeed arriving. I will still need to wait several weeks before the trees break buds and leaf-out, but the new grass shoot restored my faith in good ole mother nature.

As for most of us who have spent all or most of our lives in North Dakota, trees are highly valued. For most of us, trees have many values. They provide beautification; give us protection and many times a harvestable product. Some even credit trees for sustaining mental health. No one will question their contribution to real estate values, especially well landscaped homes. Cities take great pride in their efforts to promote trees around homes and public parks.

As we have found in North Dakota, trees are not easily grown in all locations. Like crop production, trees' soil should have a good combination of pore space, solid material and organic matter. Generally, the ideal soil composition is 50 percent pore space and 50 per cent solid material. The solid portion of the soil should be 45 percent mineral and five percent organic matter. The pore space should be 25 percent air and 25 percent water for optimum root growth. Soils with less than 50 percent pore space would have deficient oxygen levels and slower water movement, which would limit root growth.

Heavy clay soils, for example, retain high moisture levels and may become water-logged. Such soils consist of a higher proportion of the smallest soil particles with reduced pore spaces for oxygen, which restricts root growth. Soils with more than 50 percent pore space contain higher oxygen levels and allow faster water movement, permitting greater and deeper root growth than normally found in clay soils. Such soils,

for example coarse sands, are well-drained, contain less organic matter and are more droughty. Depending upon climatic locations, the benefits from increasing porosity levels will be offset by reduced water-holding capacity.

Generally, most of the feeder roots in all soils will be in the top one to three feet of soil where oxygen levels are higher. In compacted soils, pore spaces are compressed, reducing porosity, which limits available oxygen and, subsequently, limits root growth. Soil compaction from people, construction, livestock or machinery can kill otherwise healthy trees. A tree may continue to struggle for many years before dying from the effects of soil compaction. Birth trees are very susceptible to soil compaction. They tend to be shallow rooted and require a greater amount of supplemental water than trees native to this area.

Physical barriers limit the depth of root growth in soils. In this area clay pans are usually the most common barrier that limits downward growth of roots. When precipitation occurs, clay pans can create a "kettle" effect which may damage roots by drowning. Trees require water for growth but may die if soils around the roots are saturated for an extended time.

For most tree and shrub species, the lateral root growth is equivalent to the height of the tree. Some exceptions might be bur oak, black walnut, chokecherry and lilac.

Hopefully, the season for planting trees will be here soon. Before you make your choice as to what to plant, I suggest referencing the new book "Trees and Shrubs for Northern Great Plains Landscapes". It is authored by Dale Herman, Professor of Horticulture at North Dakota State University and published by the NDSU Extension Service. It sells for \$23 and can be obtained through this office by calling 701-577-4595.