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Department of  
Agriculture

Natural  
Resources  
Conservation  
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**Subject:** SOI--Cd versus Cr Soil Horizon Designations

**Date:** June 1, 2001

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**File Code:** 430

There has been much controversy, of late, regarding the use of Cd versus Cr horizon designations. The confusion and controversy seems to have started amongst the Soil Data Quality Specialists around the country but now appears to have spread to the field soil scientists, probably because of clarifications given by the various MO's. We recently received a chart from the NSSC entitled "Substrata Material Classification Decision Tree" dated 5/2001 addressing this issue. The issuance of this chart seems to have made matters worse. I feel the soil scientists of the U.S. (all) need some help to resolve this one. What ever the solution may be, I have the following recommendation to offer with regards to the definition in Soil Taxonomy and the NSSC Decision Tree.

According to Soil Taxonomy, Second Edition, 1999, densic materials "have a noncemented rupture resistance class. These are mostly earthy materials, such as till, volcanic mudflows, and some mechanically compacted materials, for example, mine spoils. Some noncemented rocks can be densic materials if they are dense or resistant enough to keep roots from entering, except in cracks." Paralithic materials "have an extremely weakly cemented to moderately cemented rupture-resistance class....Commonly, these materials are partially weathered bedrock or weakly consolidated bedrock, such as sandstone, siltstone, or shale." Other criteria addressing bulk density, cracks, and root penetration is also included in each definition.

The Substrata Material Classification Decision Tree does a good job of summarizing these conditions. It seems to me that the confusion stems from the Soil Taxonomy statement "Some noncemented rocks can be densic materials if...". This confusion is elevated by the inclusion of the "Bedrock (densic)(geologically old)" block under the Cd branch of the Decision Tree.

This seems to me to be a fairly straight forward, simple matter. If the material is bedrock related, it is either a Cr or R. If the material is earthy materials, it is either a C or Cd. To a field soil scientist, I can understand the dilemma as to when to call a horizon a C or Cd. I can also sympathize with the decision as to when to go from a Cr to R, as this can at times be quite subtle. The field decision of whether or not a layer is a Cd or Cr horizon should be a "no-brainer". We need to use common sense on this issue and leave the Cr horizon designation to the bedrock related paralithic materials and Cd to the earthy soil materials.

I am recommending you amend Soil Taxonomy under the definition of Densic Materials, to delete the statement "Some noncemented rocks can be densic materials if they are dense or resistant enough to keep roots from entering, except in cracks.", or qualify the statement by calling it an exception rather than a rule. I am also recommending you eliminate the "Bedrock (densic)(geologically old)" block under the Cd branch of the Decision Tree.