Describing Soil Color for Hydric Soils Determinations

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Primary Components of Soil Color

• Organic Matter
  – Dark brown or black

• Iron
  – Red, yellow, orange

• Mineral grains
  – Typically gray
Components of Soil Color
Mineral Grain Colors

Calvin, Matapeake, Collington, Evesboro, Penn, Manor

Photo by M. C. Rabenhorst
Describing Soil Color

• Matrix color
• Redoximorphic features
  • Type
  • Color
  • Amount
  • Location
• Any other mottles noting if they are organic or lithochromic
Aspects of Soil Color

Munsell Soil Color System

• Hue
• Value
• Chroma

10R 5/8
Hue

Spectral color in relation to red, yellow, blue, etc.

Red:
- 0
- 2.5R
- 5R
- 7.5R
- 10R

Yellow-Red:
- 0
- 2.5YR
- 5YR
- 7.5YR
- 10YR

Yellow:
- 0
- 2.5Y
- 5Y
- 7.5Y
- 10Y
Value

- 10/0 - Pure White
- 5/0 - "Gray"
- 0/0 - Pure Black

The Lightness or Darkness of Color
Chroma

“Neutral”
Gray

“I0
/2
/4
/6
/8

“Pure”
Color

Increasing strength of color

Increasing grayness
Reading Soil Colors

Optimum conditions for reading soil colors

- Natural light
- Clear, sunny day
- Midday
- Light at right angles
- Soil moist
General Rules for Recording Soil Color for Hydric Soil Determinations

• Always round to nearest hue and value
• Never round chroma
  – If a chroma is between chips note that on data sheet with a + or decimal point
  • 2.5Y 4/2+ or 2.5Y 4/2.2
Color Patterns in Soils
Matrix Color

• The dominant color or colors
Mottles

• Splotches of soil color
  – Organic features
    • Due to wetness or infilling of pores from surface horizons
  – Redoximorphic features
    • Due to wetness
  – Lithochromic features
    • Not due to wetness
Redox Features vs. Mottles

Redox Features

Lithochromic Mottles
Abundance of Features

Some indicators require different abundance thresholds than categories used for other soil survey purposed. Best to record an estimated percentage.
Contrast of Features

The degree of visual distinction between associated colors

- Faint – evident only on close examination
- Distinct – readily seen
- Prominent – contrast strongly

<table>
<thead>
<tr>
<th>Upper Threshold for Faint</th>
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<tr>
<td>Δ Hue</td>
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<tr>
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Hue | Value | Chroma
---|-------|-------
Any | ≤3    | ≤2    |
Sandy Soils

• In sandy soils with dark colors due to masking of sand grains it is important to note the percentage of grains masked (black) grains.
  – If more than 70% masked the soil will appear almost 100% black
  – If less than 70% masked the soil will have a salt and pepper look with many light colored sand grains
Masked Sand Grains

70%

50%
When soil is moist, Almost 100% of the grains should appear masked to the naked eye.
Conclusion

- Organic matter, iron and the color of the mineral grains are the primary sources of soil color.
- The Munsell Soil Color System is the standard to which we describe soil color.
- Both the color and the patterns of color in the soil are important to note when describing soil color.
The End