

SOIL COLORS AND THEIR INTERPETATION MARCH 2014

David Hammonds
Environmental Consultant
Florida Department of Health

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

1

OBJECTIVES

- Define and describe methodology for determination of soil color
- Describe proper use of Munsell color book
- Describe methodology for determination of soil color contrast

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

2

NOTE

Additional information on certain slides will be found in the "NOTES" section and will only be visible in the "normal" view in PowerPoint

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

3

Required Methodology

United States Department of
Agriculture
Natural Resources Conservation
Service
(USDA NRCS)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014 4

USDA NRCS Notation

- Officially referenced by DOH regulations
- MUST be used for all OSTDS purposes when describing soils
- No other methodology acceptable

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014 5

Methodology Describes:

- Soil Color
- Soil Texture (different presentation)
- Soil Horizonation (layering of soils, different presentation)
- Seasonal high water table indicators

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014 6

Soil Color

- Color: A key property in soil interpretation
- Most evident (observable)
- Influenced by Organic Matter (OM) content and redoximorphic (redox) sensitive metals such as Iron (Fe) and Manganese (Mn)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

7

Munsell Color Charts

Properly Coloring Soils

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

8

Munsell Coloring Information

- Current version is 2009
- Can use older books if they contain the requisite information and are like new
- Any page with missing, faded, cracked or discolored (dirty) chips must be replaced
- Using improper tools will result in wrong answers, possibly a system in violation of regulations

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

9

Munsell Color Notation

- Used to describe soil color for maximum accuracy and communication
- Three descriptive elements are used and are always written in the following specific order and manner
- HUE VALUE/CHROMA
- 5YR 4/6

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Munsell Notation - Hue

- Basis spectral color such as red, yellow, yellow-red, purple, blue, green, green-yellow, etc.
- Munsell book normally has one hue per page, except for the Gley Charts (plus two other pages that we will not cover)

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

11

HUE Symbols

- R = Red; YR = Yellow-Red; Y = Yellow
- The letter is preceded by numbers 0 to 10
- Within each letter range the Hue becomes more yellow and less red as the numbers increase

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

12

Hues

- For example:
 - 5YR is more red (less yellow) than 7.5YR
 - 2.5Y is less yellow than 5Y
- Gley Charts include Neutral, Yellow, Green, Blue, Purple, and combinations

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014 13

Hue - basis spectral color; wavelength

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014 15

Common Soil Hues

In order from most red to most yellow:

- 10R
- 2.5YR, 5YR, 7.5YR, 10YR
- 2.5Y, 5Y

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



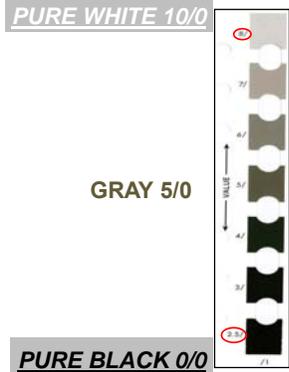
3/10/2014 15

Munsell Notation-VALUE

- Indicates the degree of lightness or darkness, or reflectance of an object viewed in daylight
- Scale is from 0 for the ideal black to 10 for the ideal white, in steps (units) that are visually equal
- Full scale not generally used for soils

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts





Value-Lightness increases from black at the bottom of page, through the grays, to nearly white at the top of the page

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Munsell Notation-Chroma

- The scale is from 0 - 8 on the Munsell Color Chart
- 0 indicates no strength of color (no color; gray) and 8 greatest strength (most color)
- Full scale not generally used for soils
- Numbers are units of Chroma

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Chroma

- Read from left (least color) to right (most color)
- *The color intensity or relative strength of color*, indicates the degree of departure from a gray of the same Value
- Color is from coloring agents like iron or manganese

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

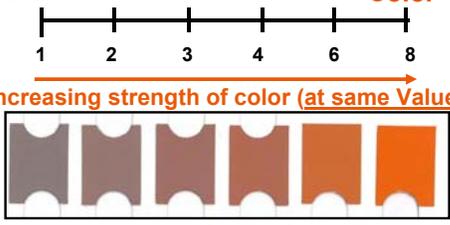


Chroma – color intensity

“Neutral” Color “Pure” Color

1 2 3 4 6 8

← Increasing strength of color (at same Value) →



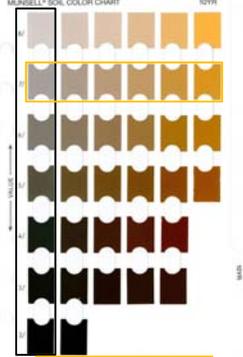
← Increasing grayness

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Value - measurement of soil organic matter (OM), the lightness or darkness of a color. Range is from 0 (pure black) to 10 (pure white).

Chroma - measurement of coloring agents like iron or manganese. Strength of color. Range is from 0 (no color) to 8 (most color).



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Munsell Book Layout

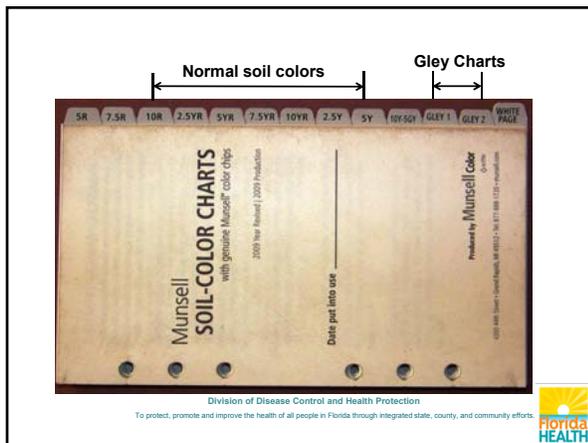
- Pages in Munsell Book are prearranged from most red through most yellow
- Gley Charts are normally found in back

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



3/10/2014

22



Munsell Book Use

- Use the book properly – Pages must be usable
- Use book as it came from manufacturer
- Do not rearrange pages
- Must have clean chips, pages as they originally came
- Do not laminate chips, take pictures of the page for use, etc.

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Munsell Book Use

- Do not take too long to read the color
- Use the *Chip Masks* if necessary
- Chip masks facilitate color matching when there is difficulty in choosing a color

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Munsell Book Use-Chip Masks

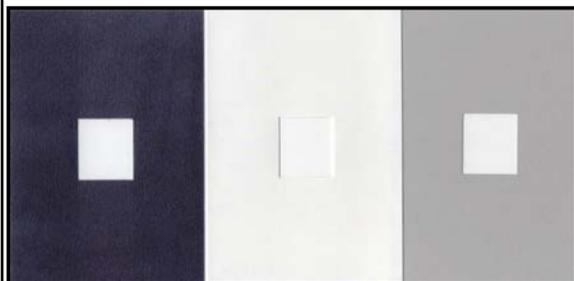
- Three masks, use mask closest in value to soil sample
- Black mask for black/very dark samples
- White mask for light colored samples
- Gray mask for all others

3/10/2014

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



CHIP MASKS



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Taped chips, missing chips, cracked chips, discolored (dirty/faded) chips. Older page on left, new on right.

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Comparison of 2 cards (New behind old. Observe differences in chip colors)

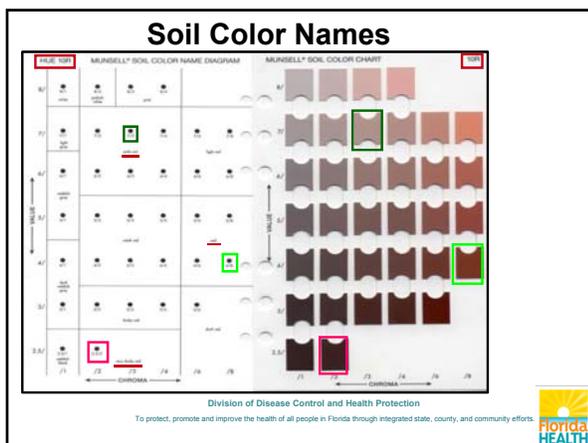
Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Correct Coloring Method

- Look to left side of Munsell book for soil color name and match Hue Value/Chroma from right side
- See next slide for examples

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

3/10/2014 30



Colors BETWEEN Chroma Chips

- Colors exist between chroma chips
- They are noted differently than others
- If the chroma is between two chips, note the lower one (more gray) and add a "+" as a notation
- Do not round up or down

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Colors BETWEEN Chroma Chips

- Example: The soil sample has more chroma than 10YR 6/1 but not enough to be 10YR 6/2
- The proper notation would be 10YR 6/1+
- This will be discussed in more detail later

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

QUESTIONS??

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts

3/10/2014 

**PROPER TECHNIQUE FOR
DETERMINING SOIL
COLORS**

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts

3/10/2014 

Correct Coloring Method

- Hold soil behind the hue card containing the color chips (the right side of the Munsell Book)
- Never put soil on front of pages
- Find the closest match from all choices in the book, read Hue Value/Chroma notation

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts

3/10/2014 

Reading soil colors

- Optimum conditions
 - Natural light
 - Clear, sunny day
 - Midday
 - Light at right angles
 - Soil is moist (not wet or dry)



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Moist Soil

- Does not glisten or have puddled water
- Doesn't darken when moisture added
- When texturing, the soil should be easily manipulated by your thumb and forefinger
- In non-sandy soils, this could be compared to moist putty

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Correct Moisture Content



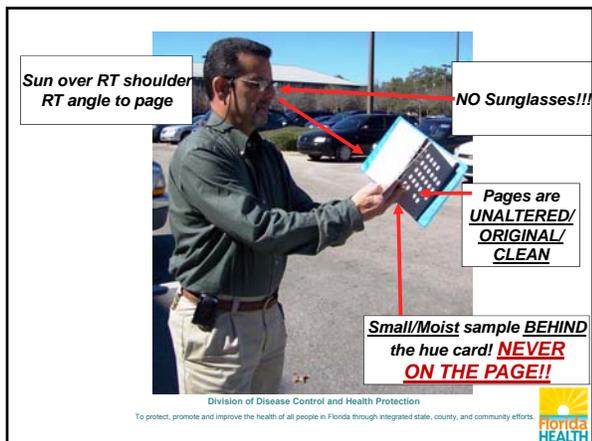
Note higher value, lower chroma

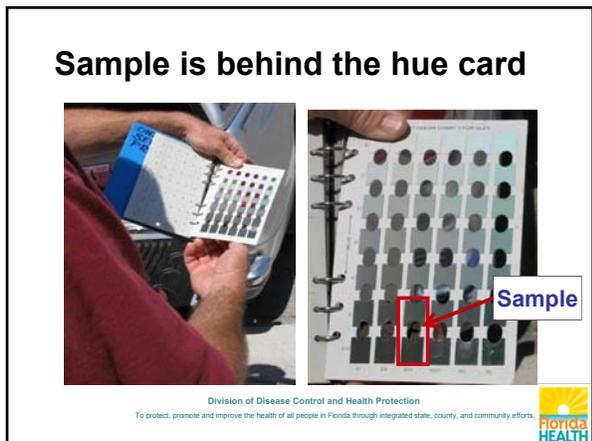
MUST USE THIS ONE

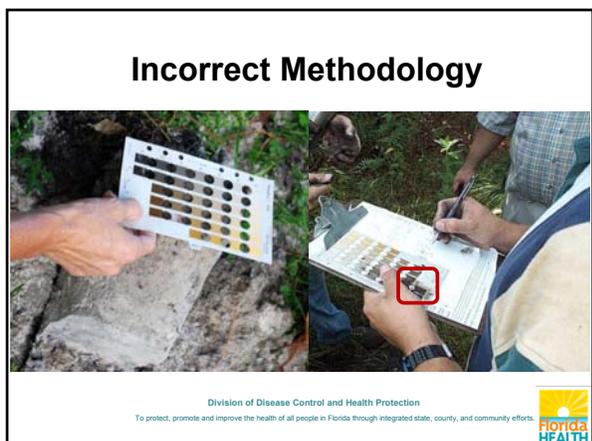
Note Glistening

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts









Low Chroma Colors

- Whenever the phrase “low chroma” is used it means that the chroma of the color is ≤ 2
- Translates to very little coloring agent except for organic matter

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

43

Low Chroma and Gley Colors

- Gley Chart colors are all low chroma colors
- *Specific* gley colors have meaning regarding the SHWT determination

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

44

Gley Charts and Their Correct Use

Different than all other pages

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

45

GLEY CHARTS

- Two supplemental charts containing grayish, bluish and greenish colors often found in very wet mineral soils are contained on these charts
- The charts also contain a Neutral Hue (labeled N) which means no chroma
- Soils with specific colors on these charts are very wet and determine the SHWT

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Gley Chart Colors

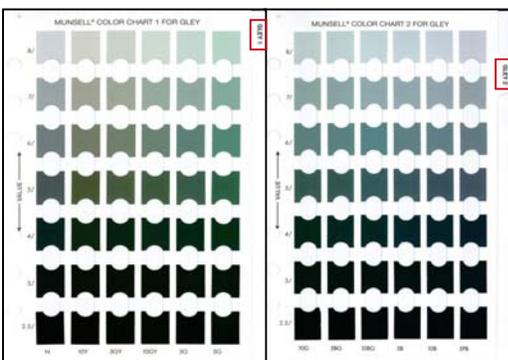
- Neutral (N)
- Yellow (Y)
- Green (G)
- Blue (B)
- Purple (P)
- Green-Yellow (GY)
- Blue-Green (BG)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

47



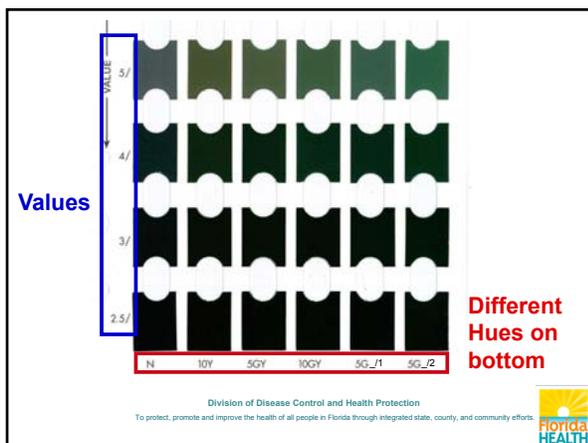
Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



The Gley Charts

- Hues are found in each individual column at the bottom of the page
- Values are read like other charts
- Chromas not evident on color chips (with two possible exceptions depending on the version being used)





Chromas for Gley Charts

- Read chroma from the English name (left side) of the charts
- Chroma designation will be to the right of the forward slash like all other chromas



Chroma read to right of forward slash

4/	4/1	4/1	4/1	4/1	4/2
dark gray		dark greenish gray			grayish green
3/	3/1	3/1	3/1	3/1	3/2
very dark gray		very dark greenish gray			very dark grayish green
2.5/	2.5/1	2.5/1	2.5/1	2.5/1	2.5/2
black		greenish black			
N	10Y	5GY	10GY	5G_1	5G_2

NO CHROMA

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Gley Chart Chromas

- All chromas on Gley Charts are chroma 1, except for two hues:
- N (Neutral) having 0 (no) chroma (this is due to lack of iron giving any color)
- 5G_2

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Soil Color Contrast

Determining Differences between soil colors

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Compare Components Correctly

- Compare Hue to Hue-ignore value and chroma color components
- Compare Value to Value-ignore hue and chroma color components
- Compare Chroma to Chroma-ignore hue and value color components

3/10/2014

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



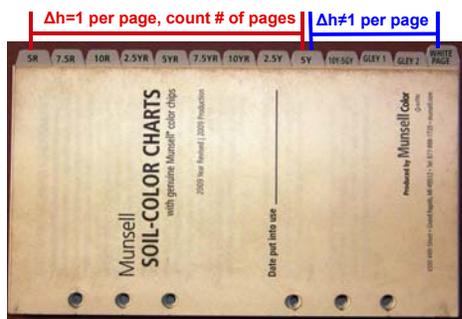
Hue Difference

- First must determine the difference in the HUE of each color
- Use color wheel (later slide)
- Quick method for most colors is to count pages in accordance with following diagram. (Note: Δ signifies "change in" and "h" signifies Hue; therefore Δh means change in Hue)

3/10/2014

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts

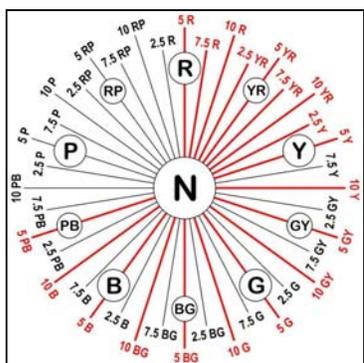




Use of the Munsell Hue Circle

USDA NRCS Technical Note 2





Munsell Hue Circle



To calculate Hue Change:

- Count the number of 2.5-unit intervals
- 2.5YR and 7.5YR differ by two 2.5-unit intervals (7.5-2.5=5, which is two 2.5-unit intervals), therefore $\Delta h=2$
- Hues of 5Y and 5GY differ by four 2.5-unit intervals, therefore $\Delta h=4$
- Could also just use the wheel



Counting Hue Change

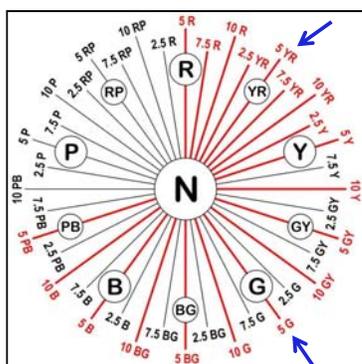
- Count the number of hues as you go CLOCKWISE on wheel
- Example: Difference between 5YR and 5G is a difference of 12 hue units
- Consider ONLY the Hue information, ignore value/chroma information

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

61



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



3/10/2014

62

Hue change from Neutral

The Hue change from neutral to any other hue is a change of one unit of hue

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



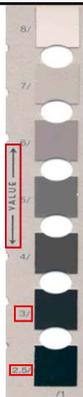
Units of Value Change

- Units of value range from 0 to 10
- Normally have one unit of change between each stated value, but there may be less
- Example:
- The difference in Value between a 10YR 5/1 and a 10YR 7/1 is 2 UNITS. (The difference between 5 and 7 is 2)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



- Values can change by as little as 0.5 units
- Difference between a value of 2.5 and a value of 3 is 0.5 units (<1 unit of value change)
- If you were to count chips, the answer would appear to be 1, which would be wrong
- Don't count chips



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



TO DETERMINE VALUE CHANGE, CALCULATE DIFFERENCE BETWEEN THE UNITS (Value of 2.5, 3, 4, etc.) –

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Units of Chroma Change

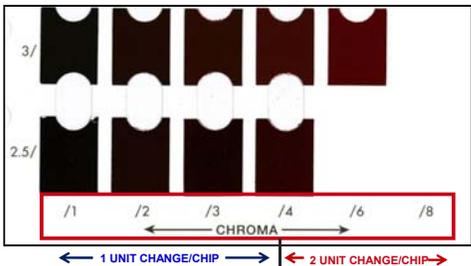
- Units for Chroma range from 0 to 8
- There is a one or two unit change between each chroma in the soil color book
- Exception would be if you fall between two chromas such as a chroma 2 and 2+ (as in stripped matrix)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



3/10/2014 67

Units of Chroma Change



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Units of Chroma Change

- The difference in Chroma between a 10YR 5/3 and a 10YR 5/6 is 3 units ($6-3=3$)
- Counting chips would lead to conclusion of a two chip difference which is the wrong answer
- Chroma change would be counted as 3
- *Do not count chips!!!*

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



**TO DETERMINE CHROMA
CHANGE, CALCULATE
DIFFERENCE BETWEEN THE
UNITS
(Chroma of 1, 2, 3, 4, etc.) –**

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



- When determining the soil color difference, compare Value to Value and Chroma to Chroma
- Change in hue does not affect the calculation of the difference between values or chromas, they are independent of each other
- Simply determine the value or chroma in each color and calculate the difference without regard to hue

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



QUESTIONS?

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Soil Color Contrast

Contrast refers to the degree of visual distinction between associated colors

Faint – contrasts that are evident only on close examination

Distinct -- contrasts that are readily seen but are only moderately expressed

Prominent -- contrasts that are strongly expressed

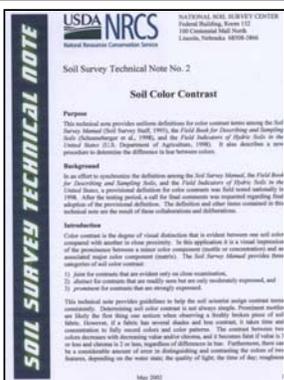
Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



- Different people cannot uniformly and consistently judge these subjective criteria with no other guidelines
- An objective method is needed to judge the soil color contrast
- Use the USDS NRCS Soil Survey Technical Note No. 2, May 2002 entitled "Soil Color Contrast"

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.





Cover page

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Definitions of soil color contrast terms

Note: If the mottle and matrix both have values of ≤ 3 and chromas of ≤ 2 , the color contrast is *Faint*, regardless of the difference in hue.

Faint - Evident only on close examination. The contrast is faint if the:

- 1) difference in hue = 0, difference in value is ≤ 2 , and difference in chroma is ≤ 1 , or
- 2) difference in hue = 1, difference in value is ≤ 1 , and difference in chroma is ≤ 1 , or
- 3) difference in hue = 2, difference in value = 0, and difference in chroma = 0, or
- 4) difference in hue is ≥ 3 and both colors have values of ≤ 3 and chromas of ≤ 2 .

Distinct - Readily seen but contrast only moderately with the color to which compared. The contrast is distinct if the:

- 1) difference in hue = 0, and
 - a. difference in value is ≤ 2 and difference in chroma is > 1 to < 4 , or
 - b. difference in value is > 2 to < 4 and difference in chroma is < 4 .
- 2) difference in hue = 1, and
 - a. difference in value is ≤ 1 and difference in chroma is > 1 to < 3 , or
 - b. difference in value is > 1 to < 3 , and difference in chroma is < 3 .
- 3) difference in hue = 2, and
 - a. difference in value = 0 and difference in chroma is > 0 to < 2 , or
 - b. difference in value is > 0 to < 2 and difference in chroma is < 2 .

Prominent - Contrasts strongly with the color to which compared. Color contrasts that are not faint or distinct are prominent.

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



- In the following slides, the symbol “ Δ ” (delta) means “change or difference in”
- For example: $\Delta h = 1$ means the change of hue between the two colors is one 2.5-unit interval
- Example 7.5YR to 10YR
Use the method given in the technical note to determine hue difference (already covered)

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



IMPORTANT NOTE

- If the mottle and matrix both have values of ≤ 3 and chromas of ≤ 2 , the color contrast is faint by definition
- This is regardless of the difference in hue

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Hues differ by 2 ($\Delta h = 2$)

Δ Value	Δ Chroma	Contrast
0	0	Faint
0	1	Distinct
0	≥ 2	Prominent
1	≤ 1	Distinct
1	≥ 2	Prominent
≥ 2	---	Prominent

$\Delta h = 2$
 1 Faint
 2 Distinct
 3 Prominent
 (Note that a Δ value or Δ chroma ≥ 2 is prominent)

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Hues differ by 3 or more ($\Delta h \geq 3$)

Δ Value	Δ Chroma	Contrast
Color contrast is prominent, except for low chroma and value.		Prominent

$\Delta h \geq 3$

- All color contrast is prominent by definition
- Exception: Colors with values ≤ 3 and chromas ≤ 2 are faint by definition, regardless of hue change

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

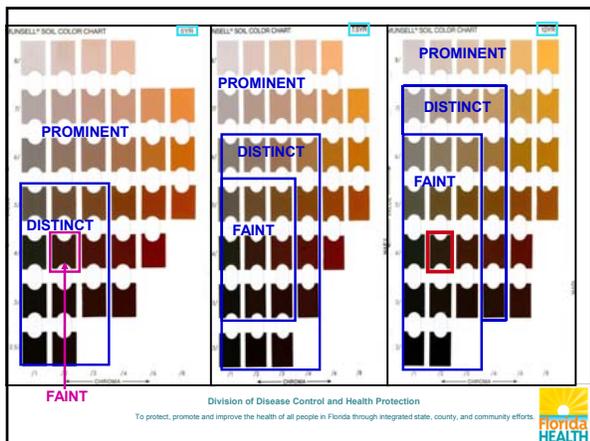


Soil Color Contrast Examples

- On the following slide, the matrix Color 10YR 4/2 (red box area) is used for comparison to surrounding colors
- The soil color contrasts are as follows

Division of Disease Control and Health Protection
 To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.





If you believe you have found a discrepancy in the chart:

USE "DEFINITION OF SOIL COLOR CONTRAST TERMS"

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

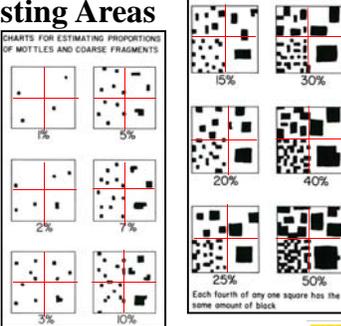
Determining Amount of Mottles

- Use "Charts for Estimating Proportions of Mottles and Coarse Fragments"
- Quantifies the amount of redox features
- Located in Munsell Book

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Abundance and Size of Color Contrasting Areas

- **Size of mottles**
Fine < 5 mm
Medium 5 to 15 mm
Coarse > 15 mm
- *Note that the size of the mottles do not matter, only the amount*



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



QUESTIONS?

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

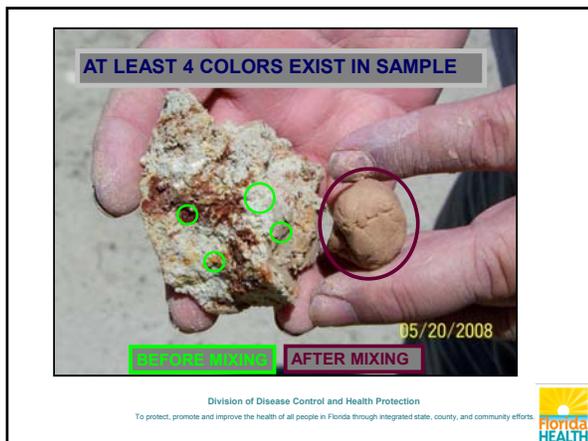


Color or Texture First?

- **Color**-Redox features could be overlooked due to the physical manipulation of the soil if it was textured first
- All colors in the sample are recorded before texturing
- Multiple colors easily blend
- The same soil sample should be used to color and texture-increases accuracy of the profile

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.





Soil Sampling

- All samples should come from an area that has not been marred from the action of taking the sample
- Especially true for heavy-textured soils
- Samples come from auger buckets, shovels, backhoe buckets, etc.
- Ensure that sample is natural soil, not adulterated

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Sampling heavy-textured soils

- Obtain sample from the area of least disturbance, normally interior of the sample
- The soil sample should be broken longitudinally to observe the colors and to collect the sample for texturing

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



EXAMPLE IN AUGER BUCKET



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



**Outside of sample-
air changed color of
sample, now more
red**

INSIDE THE AUGER BUCKET

**Inside of sample-no
oxidation-correct
color of soil as it
appears in profile**



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Sandy soils

- Samples don't normally come out in chunks as do finer textured soils
- Must be unadulterated and unmarred (sandy soils can contain other things)
- When sampling any soil, ensure that sample is a natural sample from the intended area

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts



Sandy Soil with Red Mottles



Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Sample Observations

- Take the time to properly observe soil sample
- Redox features can be missed while using an auger
- Larger sample size increases area for SHWT indicator observation
- Sharpshooter-type shovels should be used closer to ground surface

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.





Approximate comparison between samples found in auger and sharpshooter-type shovel

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



END OF PRESENTATION

QUESTIONS?

Division of Disease Control and Health Protection
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



3/10/2014 100
