
MUNSELL
SOIL COLOR CHARTS

MUNSELL® SOIL COLOR CHARTS

YEAR
2000
REVISED
WASHABLE
EDITION

MUNSELL® COLOR

GretagMacbeth
617 Little Britain Road, New Windsor, NY 12553
Tel: (800) 622-2384, (845) 565-7660. Fax: (845) 565-2511

DETERMINATION OF SOIL COLOR

quoted in part from
U.S. Dept. Agriculture Handbook 18–Soil Survey Manual

Soil colors are most conveniently measured by comparison with a color chart. The collection of charts generally used with soils is a modified version of the collection appearing in the Munsell Book of Color and includes only that portion needed for soils, about one-fifth of the entire range found in the complete edition.

The nine charts in the Soil Collection display 322 different standard color chips systematically arranged according to their Munsell notations, on cards carried in a loose leaf notebook. The arrangement is by the three dimensions that combine to describe all colors and are known in the Munsell system as Hue, Value and Chroma.

The Hue notation of a color indicates its relation to Red, Yellow, Green, Blue, and Purple; the Value notation indicates its lightness; and the Chroma notation indicates its strength (or departure from a neutral of the same lightness).

The colors displayed on the individual Soil Color Charts are of constant Hue, designated by a symbol in the upper right hand-corner of the card. Vertically, the colors become successively lighter from the bottom of the card to the top in visually equal steps; their value increases. Horizontally they increase in Chroma from left to right. The Value notation of each chip is indicated by the vertical scale in the far left column of the chart. The Chroma notation is indicated by the horizontal scale across the bottom of the chart.

"The nomenclature for soil color consists of two complementary systems: (1) Color names; and (2) the Munsell notation of color. Neither of these alone is adequate for all purposes. The color names are employed in all descriptions for publication and for general use.

The Munsell notation is used to supplement the color names wherever greater precision is needed, as a convenient abbreviation in field descriptions, for expression of the specific relations between colors, and for statistical treatment of color data. The Munsell notation is especially useful for international correlation, since no translation of color names is needed. The names for soil colors are common terms now so defined as to obtain uniformity and yet accord, as nearly as possible, with past usage by soil scientists. Names like 'rusty brown,' 'mouse gray,' 'lemon yellow,' and 'chocolate brown' should never be used."

The soil color names and their limits are given in the diagrams which appear opposite each chart.

"The Munsell notation for color consists of separate notations for hue, value, and chroma, which are combined in that order to form the color designation. The symbol for hue is the letter abbreviation of the color of the rainbow (R for red, YR for Yellow-Red, Y for yellow) preceded by numbers from 0 to 10. Within each letter range, the hue becomes more yellow and less red as the numbers increase. The middle of the letter range is at 5; the zero point coincides with the 10 point of the next redder hue. Thus 5YR is in the middle of the yellow-red hue, which extends from 10R (zero YR) to 10YR (zero Y)."

"The notation for value consists of numbers from 0, for absolute black, to 10, for absolute white. Thus a color of value 5/ is visually midway between absolute white and absolute black. One of value 6/ is slightly less dark, 60 percent of the way from black to white, and midway between values of 5/ and 7/."

"The notation for chroma consists of numbers beginning at 0 for neutral grays, and increasing at equal intervals to a maximum of about 20, which is never really approached in soil. For absolute achromatic colors (pure grays, white, and black), which have zero chroma and no hue, the letter N (neutral) takes the place of a hue designation."

"In writing the Munsell notation, the order is hue, value, chroma with a space between the hue letter and the succeeding value number, and a diagonal between the two numbers for value and chroma. If expression beyond the whole numbers is desired, decimals are always used, never

fractions. Thus the notation for a color of hue 5YR, value 5, chroma 6, is 5YR 5/6, a yellowish-red. The notation for a color midway between the 5YR 5/6 and 5YR 6/6 chips is 5YR 5.5/6; for one midway between 2.5YR 5/6 and 5YR 6/8, it is at 3.75YR 5.5/7. The notation is decimal and capable of expressing any degree of refinement desired. Since color determinations cannot be made precisely in the field–generally no closer than half the interval between colors in the chart–expression of color should ordinarily be to the nearest color chip."

"In using the color charts, accurate comparison is obtained by holding the soil sample directly behind the apertures separating the closest matching color chips. Rarely will the color of the samples be perfectly matched by any color in the chart. The probability of having a perfect matching of the sample color is less than one in one hundred. It should be evident, however, which colors the sample lies between, and which is the closest match. The principal difficulties encountered in using the Soil Color Chart are (1) in selecting the appropriate hue card, (2) in determining colors that are intermediate between the hues in the chart and (3) in distinguishing between value and chroma where chromas are strong. In addition, the chart does not include some extreme dark, strong (low value, high chroma) colors occasionally encountered in moist soils. With experience, these extreme colors lying outside the range of the chart can be estimated."

The use of a mask will facilitate color matching. Two masks are included in the binder pocket: a black mask for use with dark samples and a gray mask for intermediate and light samples. The aperture in the mask allows exposure of four adjacent color chips; the remaining colors in the field are covered to eliminate the possibility of disturbing contrasts.

"While important details should be given, long involved designation of color should generally be avoided, especially with variegated or mottled colors. In these, only the extreme or dominant colors need be stated. Similarly, in giving the color names and Munsell notations for both the dry and moist colors, an abbreviated form, such as 'reddish brown' (5YR 4/4; 3/4 moist), simplifies the statement."

"By attempting detail beyond the allowable accuracy of field observations and sample selection, one may easily make poorer soil descriptions than by expressing the dominant colors simply. In all descriptions, terms other than the ones given on these charts should be used only in rare instances, and then only as supplemental expressions in parentheses where some different local usage is common."

"The ability to sense color differences varies among people even among those not regarded as color blind." The Farnsworth-Munsell 100 Hue Test, available from Munsell Color, is a dual-purpose test which examines subjects for color anomalies and at the same time grades color normals on their color discrimination competency.

The Year 2000 Revised Washable Edition incorporates several changes from the previous editions as outlined below:

- The number of Gley colors have been more than doubled. As a result, there are now two Gley Charts. The first chart includes Neutrals, 10Y, 5GY, 10GY, 5G at /1 chroma and 5G at /2 chroma. The second chart includes 10G, 5BG, 10BG, 5B, 10B and 5PB at /1 chroma.
- 7/1 to 7/8 and 8/1 to 8/4 have been added to the 10R chart.
- 8/1 to 8/4 colors have been added to the 2.5YR chart.

The Year 2000 Revised Washable Edition of the Soil Color Charts can also be used for the evaluation of skin, hair and eye color in anthropology, criminology, pathology and forensic medicine.

GRANULAR AND CRUMB STRUCTURES

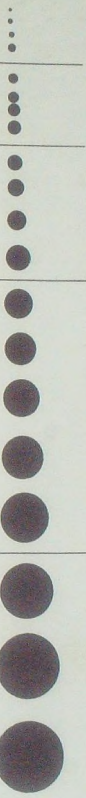
Very Fine
(less than 1 mm. diameter)

Fine
(1-2 mm. diameter)

Medium
(2-5 mm. diameter)

Coarse
(5-10 mm. diameter)

Very Coarse
(more than 10 mm. diameter)



PLATY STRUCTURES

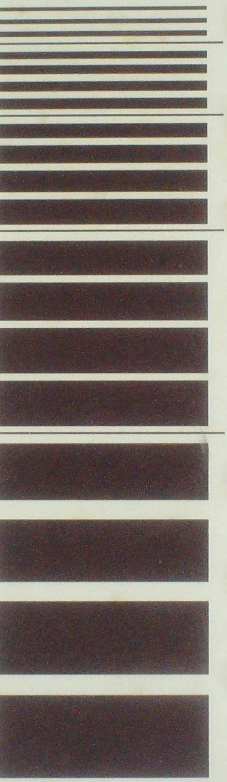
Very Fine
(less than 1 mm.)

Fine
(1–2 mm. thick)

Medium
(2–5 mm. thick)

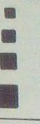
Coarse
(5–10 mm. thick)

Very Coarse
(more than
10 mm. thick)



ANGULAR AND SUBANGULAR BLOCKY STRUCTURES

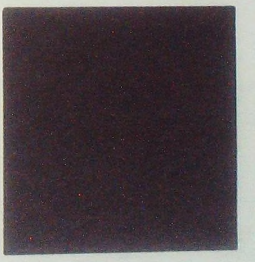
Very Fine
(less than 5 mm. diameter)



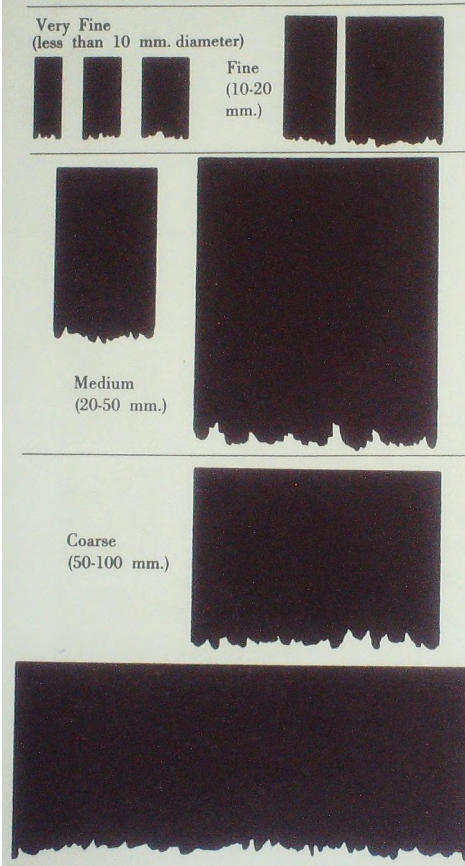
Fine
(5-10 mm. diameter)

Medium
(10-20 mm. diameter)

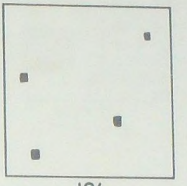
Coarse
(20-50 mm.
diameter)



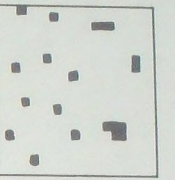
PRISMATIC AND COLUMNAR STRUCTURES



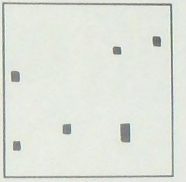
CHARTS FOR ESTIMATING PROPORTIONS OF MOTTLES AND COARSE FRAGMENTS



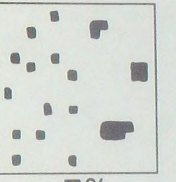
1%



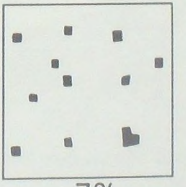
5%



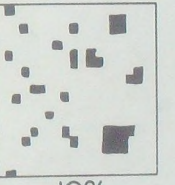
2%



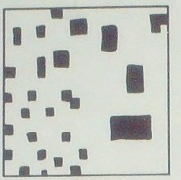
7%



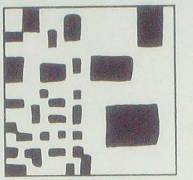
3%



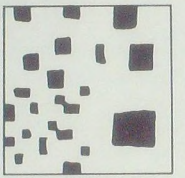
10%



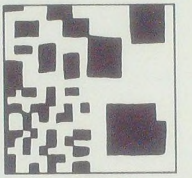
15%



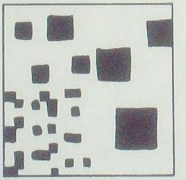
30%



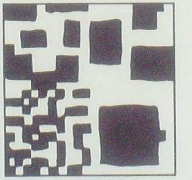
20%



40%

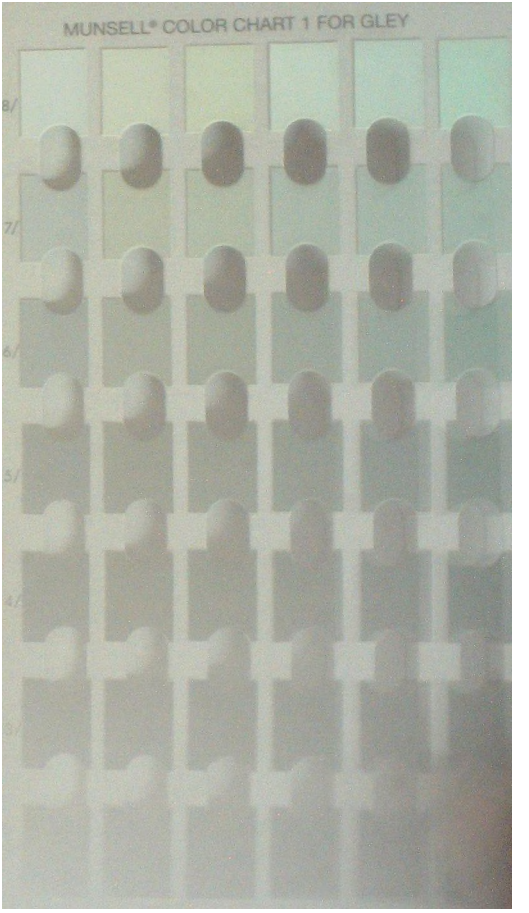


25%

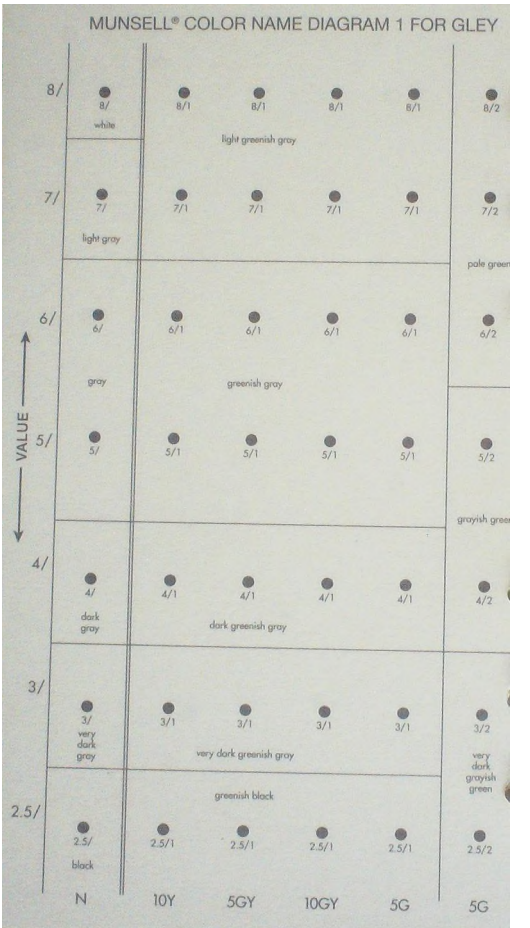


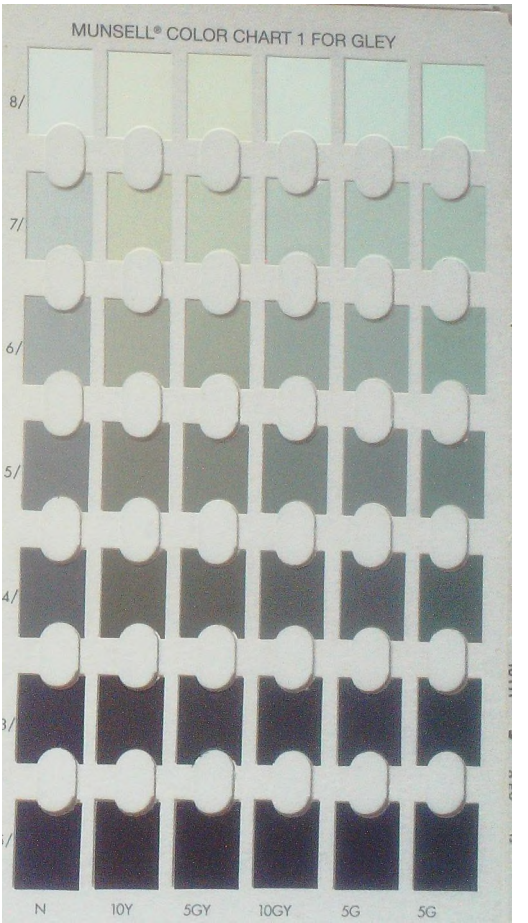
50%

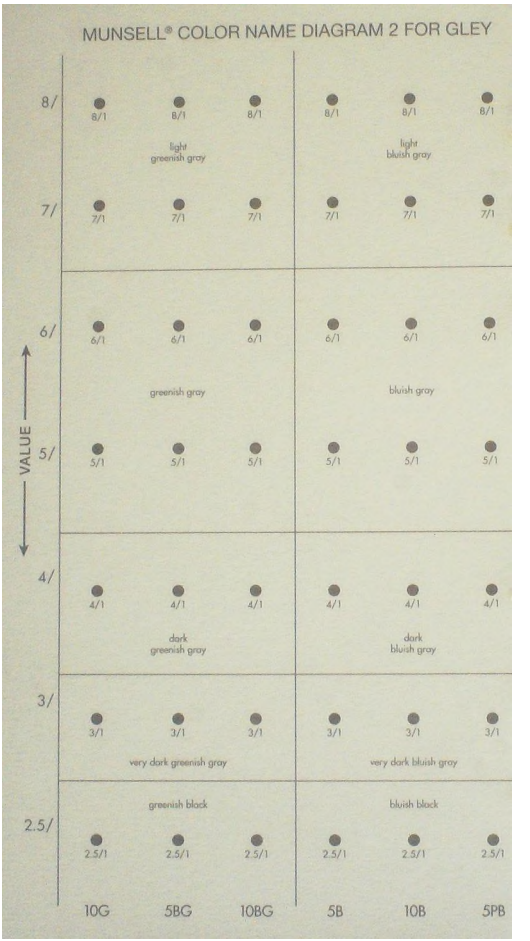
Each fourth of any one square has the same amount of black


MUNSELL® COLOR CHART 1 FOR GLEY
8/
7/
6/
5/
4/

To order additional blank sheets, that are on "Rite in the Rain" papers,
please contact: Dickard Widder's Customer's Service Dept.
(718) 326-3700


MUNSELL® COLOR NAME DIAGRAM 1 FOR GLEY
VALUE
8/
7/
6/
5/
4/
3/
2.5/
8/
white
8/1
8/1
8/1
8/1
8/2
light greenish gray
7/
light gray
7/1
7/1
7/1
7/1
7/2
pale green
6/
gray
6/1
6/1
6/1
6/1
6/2
greenish gray
5/
5/
5/1
5/1
5/1
5/1
5/2
grayish green
4/
dark gray
4/1
4/1
4/1
4/1
4/2
dark greenish gray
3/
very dark gray
3/1
3/1
3/1
3/1
3/2
very dark greenish gray
very dark grayish green
greenish black
2.5/
black
2.5/1
2.5/1
2.5/1
2.5/1
2.5/2
N
10Y
5GY
10GY
5G
5G


MUNSELL® COLOR CHART 1 FOR GLEY
8/
7/
6/
5/
4/
3/
N
10Y
5GY
10GY
5G
5G

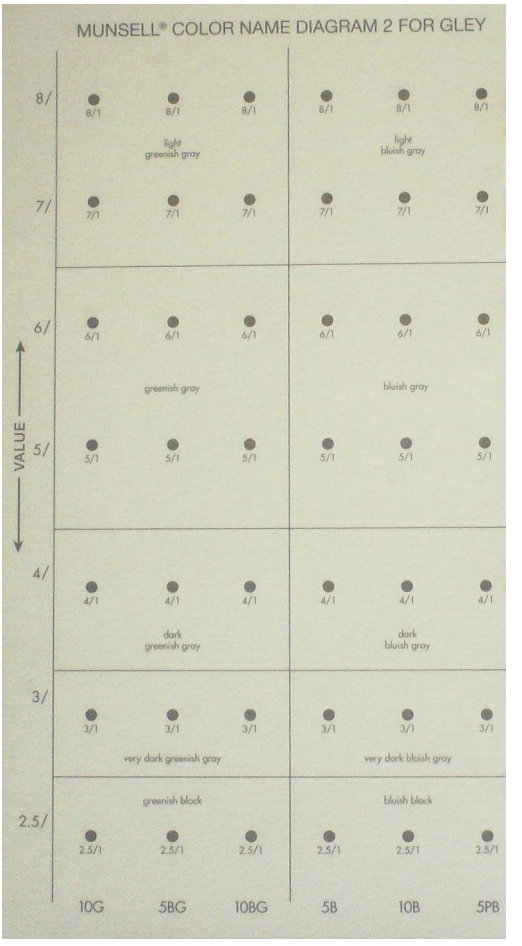

MUNSELL® COLOR NAME DIAGRAM 2 FOR GLEY
VALUE
8/
7/
6/
5/
4/
3/
2.5/
8/1
7/1
6/1
5/1
4/1
3/1
2.5/1
light greenish gray
light bluish gray
greenish gray
bluish gray
dark greenish gray
dark bluish gray
very dark greenish gray
very dark bluish gray
greenish black
bluish black
10G
5BG
10BG
5B
10B
5PB

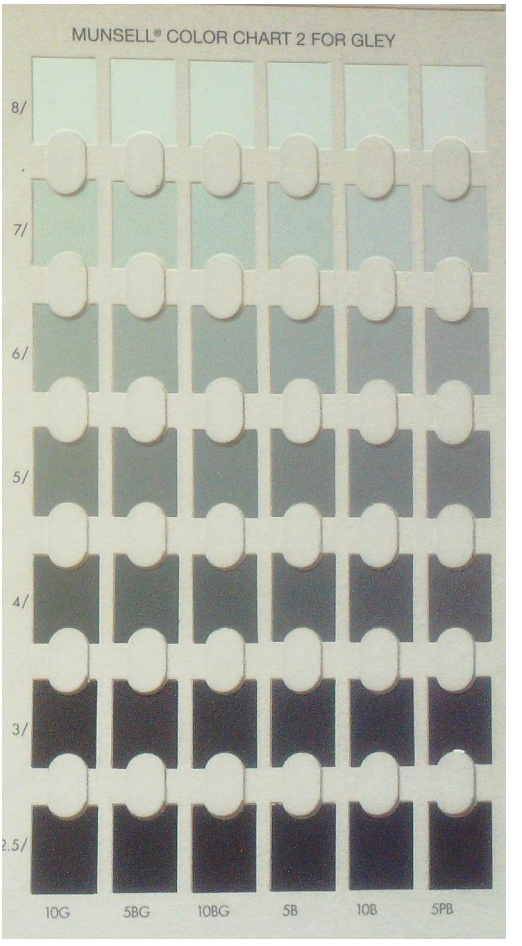
MUNSELL® COLOR CHART 2 FOR GLEY

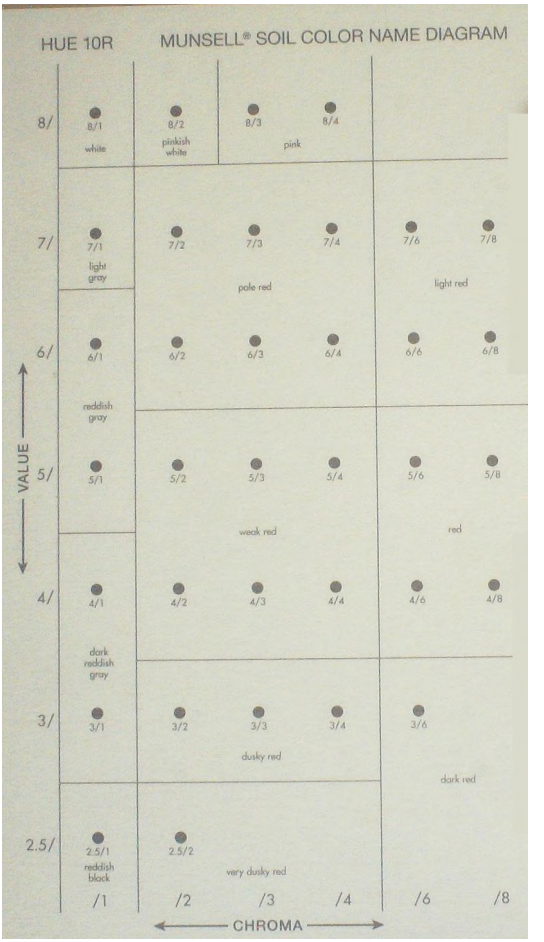
8/
7/
6/
5/
4/
3/
2.5/

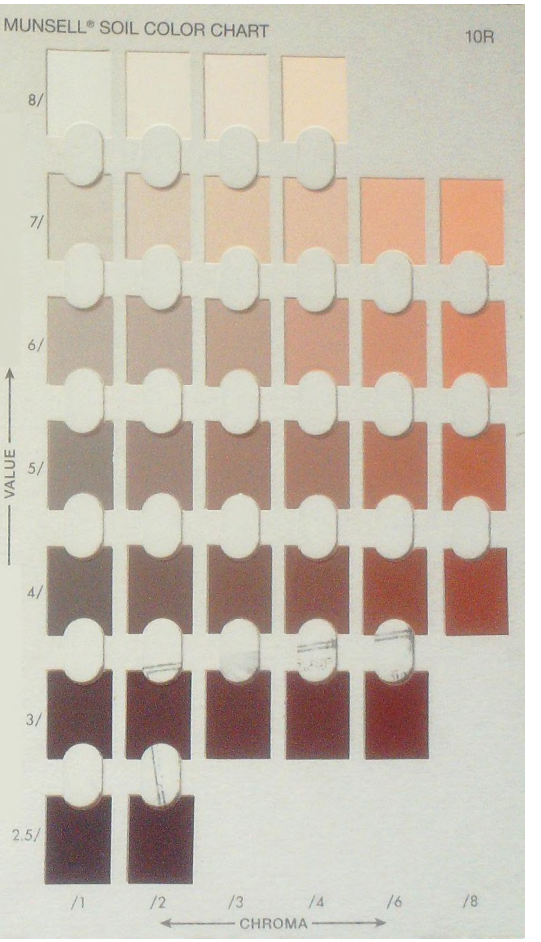
10G 5BG 10BG 5B 10B 5PB

GLEY 2
10R
2.5YR
5YR
7.5YR
10YR
2.5Y

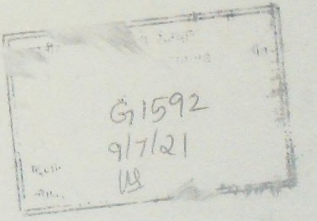

MUNSELL® COLOR NAME DIAGRAM 2 FOR GLEY
VALUE
8/
7/
6/
5/
4/
3/
2.5/
8/1
light greenish gray
light bluish gray
7/1
6/1
greenish gray
bluish gray
5/1
4/1
dark greenish gray
dark bluish gray
3/1
very dark greenish gray
very dark bluish gray
greenish black
bluish black
2.5/1
10G
5BG
10BG
5B
10B
5PB

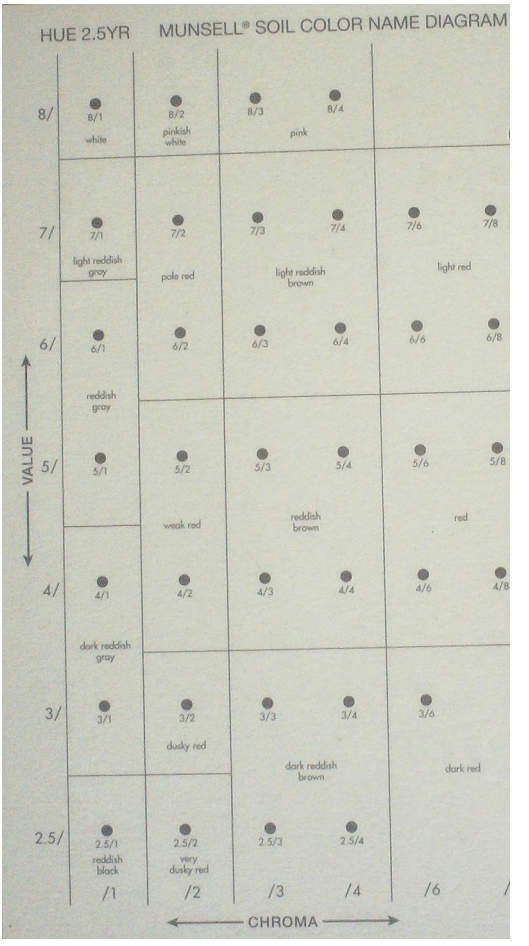

MUNSELL® COLOR CHART 2 FOR GLEY
8/
7/
6/
5/
4/
3/
2.5/
10G
5BG
10BG
5B
10B
5PB

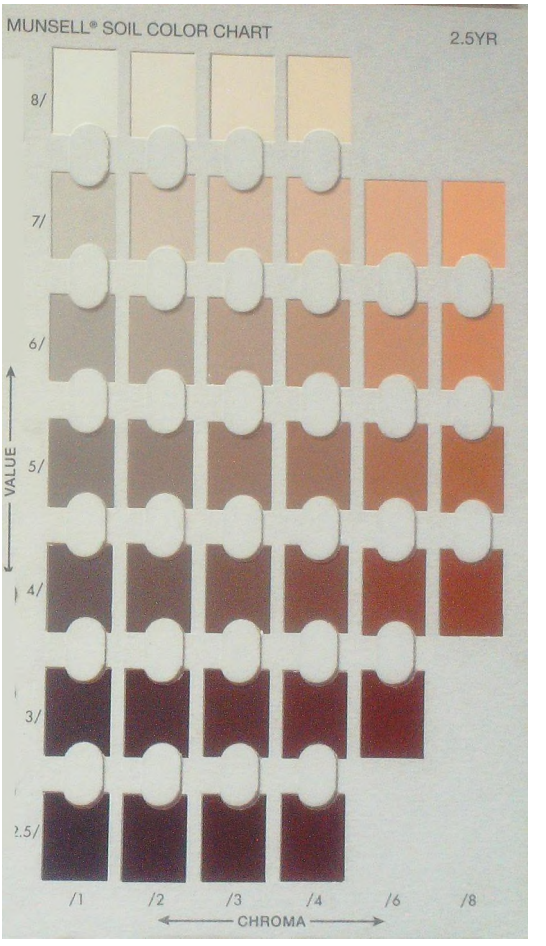

HUE 10R
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
pinkish white
8/3
8/4
pink
7/1
light gray
7/2
7/3
7/4
pale red
7/6
7/8
light red
6/1
reddish gray
6/2
6/3
6/4
6/6
6/8
5/1
5/2
5/3
5/4
weak red
5/6
5/8
red
4/1
dark reddish gray
4/2
4/3
4/4
4/6
4/8
3/1
3/2
3/3
3/4
dusky red
3/6
dark red
2.5/1
reddish black
2.5/2
very dusky red
/1
/2
/3
/4
/6
/8
CHROMA

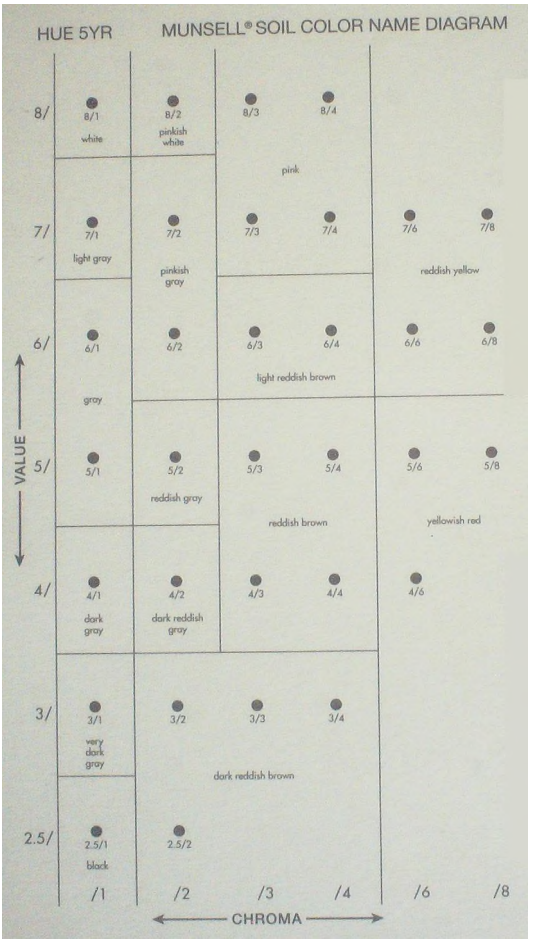

MUNSELL® SOIL COLOR CHART
10R
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

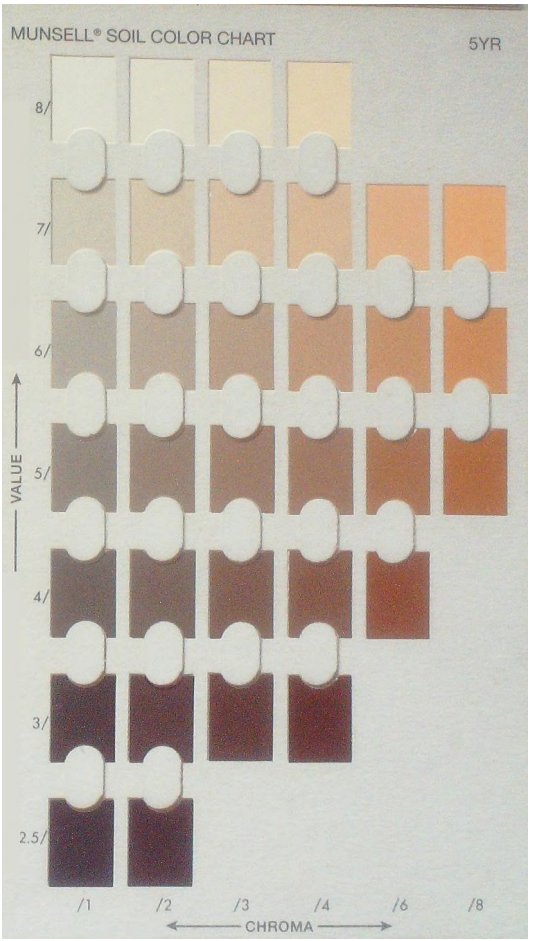
pink
light re
red
dark re

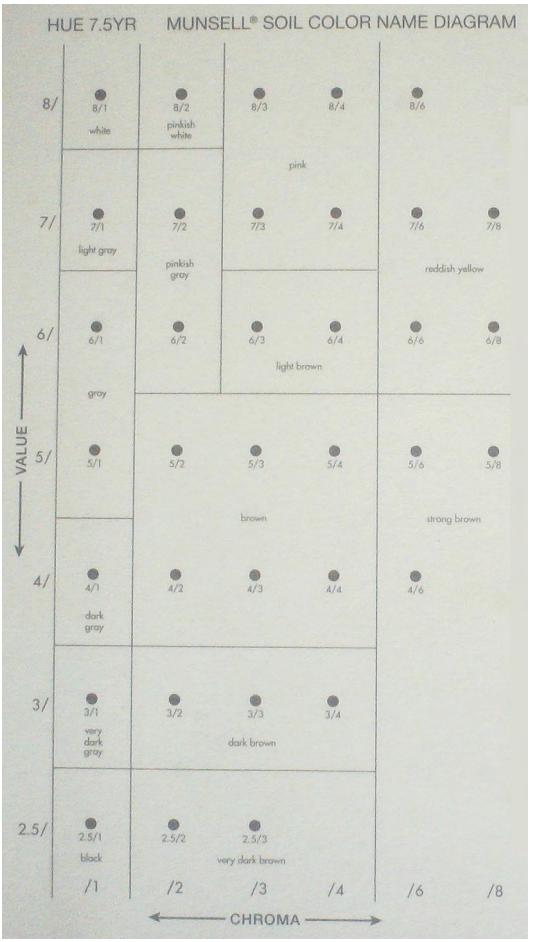


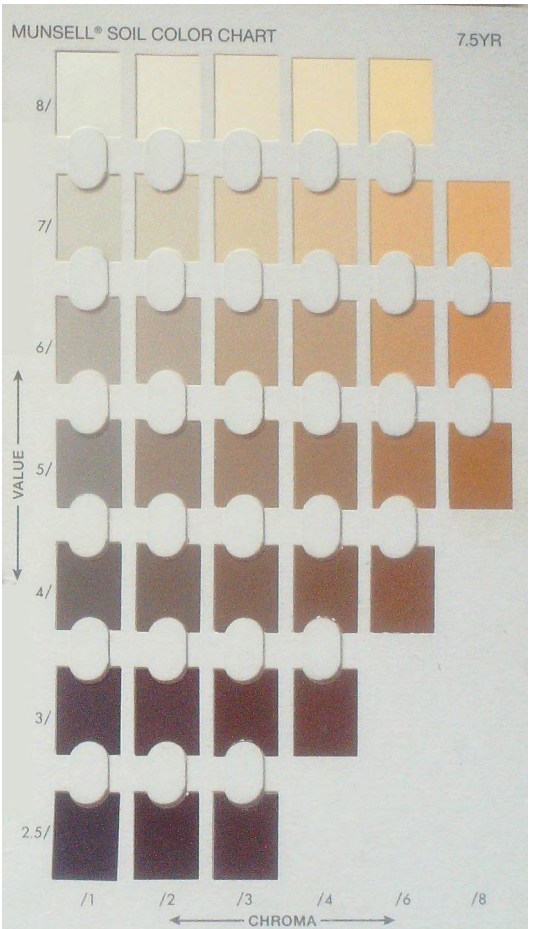

HUE 2.5YR
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
pinkish white
8/3
8/4
pink
7/1
light reddish gray
7/2
pale red
7/3
7/4
light reddish brown
7/6
7/8
light red
6/1
reddish gray
6/2
6/3
6/4
6/6
6/8
5/1
5/2
weak red
5/3
5/4
reddish brown
5/6
5/8
red
4/1
dark reddish gray
4/2
4/3
4/4
4/6
4/8
3/1
3/2
dusky red
3/3
3/4
dark reddish brown
3/6
dark red
2.5/1
reddish black
2.5/2
very dusky red
2.5/3
2.5/4
/1
/2
/3
/4
/6
CHROMA

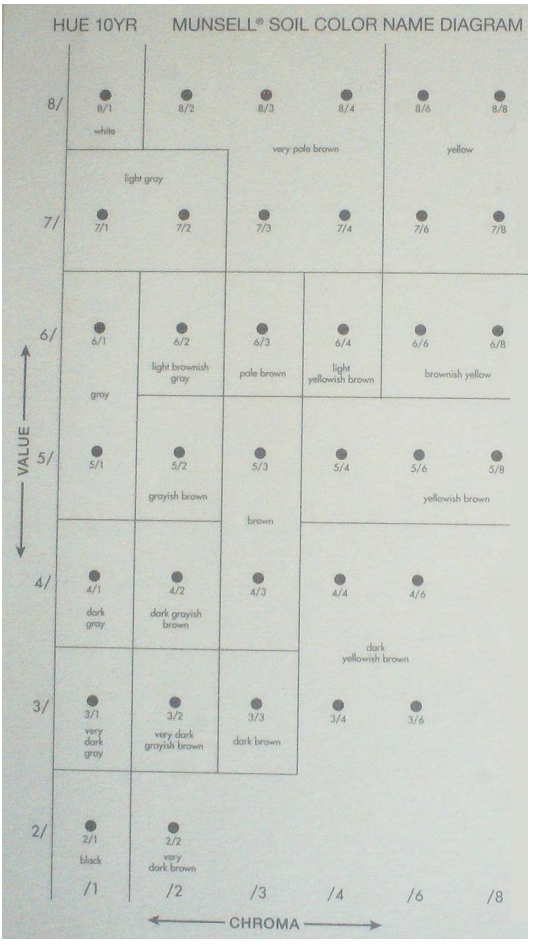

MUNSELL® SOIL COLOR CHART
2.5YR
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

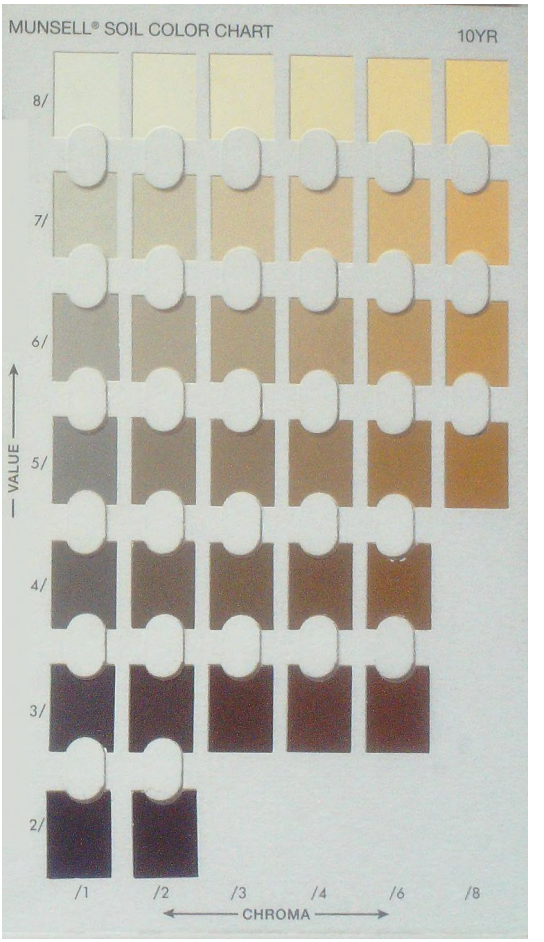

HUE 5YR
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
pinkish white
8/3
8/4
pink
7/1
light gray
7/2
pinkish gray
7/3
7/4
7/6
7/8
reddish yellow
6/1
gray
6/2
6/3
6/4
light reddish brown
6/6
6/8
5/1
5/2
reddish gray
5/3
5/4
reddish brown
5/6
5/8
yellowish red
4/1
dark gray
4/2
dark reddish gray
4/3
4/4
4/6
3/1
very dark gray
3/2
3/3
3/4
dark reddish brown
2.5/1
black
2.5/2
/1
/2
/3
/4
/6
/8
CHROMA

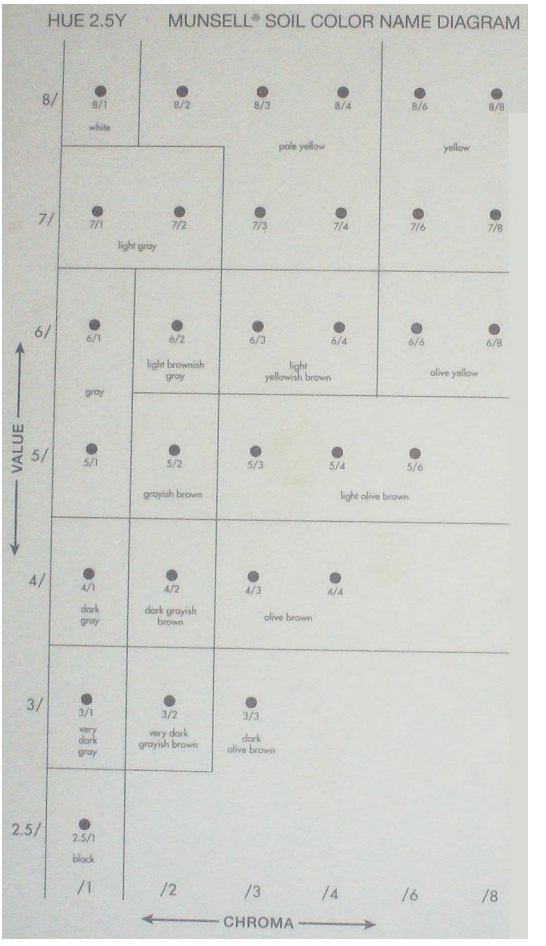

MUNSELL® SOIL COLOR CHART
5YR
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

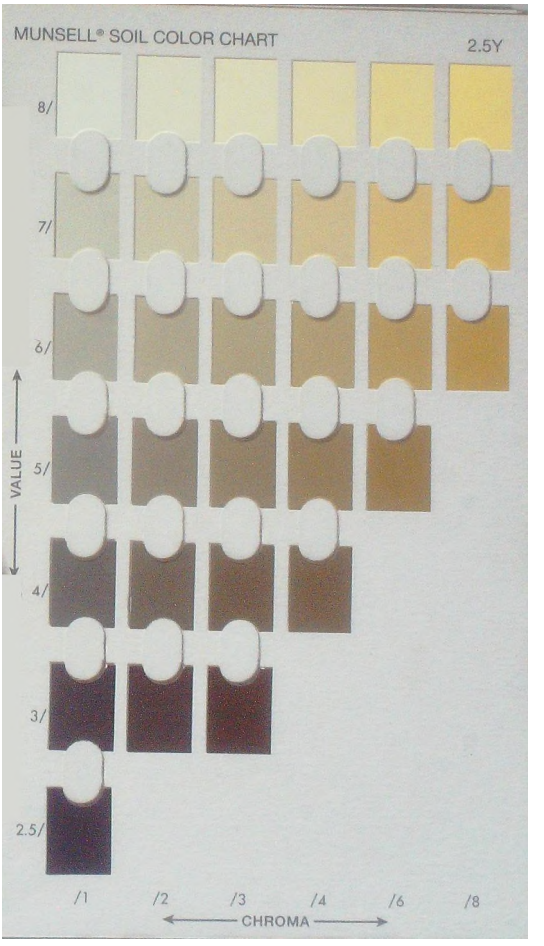

HUE 7.5YR
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
pinkish white
8/3
8/4
8/6
pink
7/1
light gray
7/2
pinkish gray
7/3
7/4
7/6
7/8
reddish yellow
6/1
gray
6/2
6/3
6/4
6/6
6/8
light brown
5/1
5/2
5/3
5/4
5/6
5/8
brown
strong brown
4/1
dark gray
4/2
4/3
4/4
4/6
3/1
very dark gray
3/2
3/3
3/4
dark brown
2.5/1
black
2.5/2
2.5/3
very dark brown
/1
/2
/3
/4
/6
/8
CHROMA

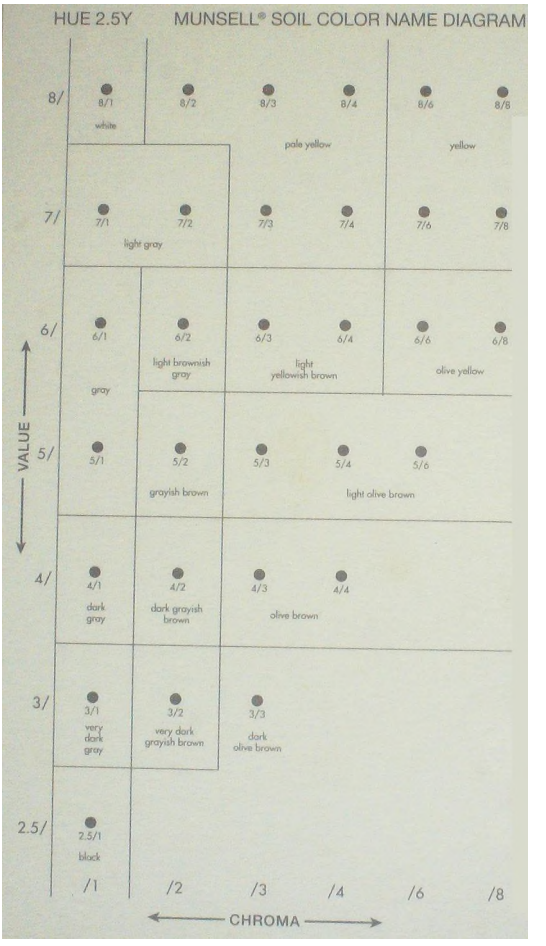

MUNSELL® SOIL COLOR CHART
7.5YR
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

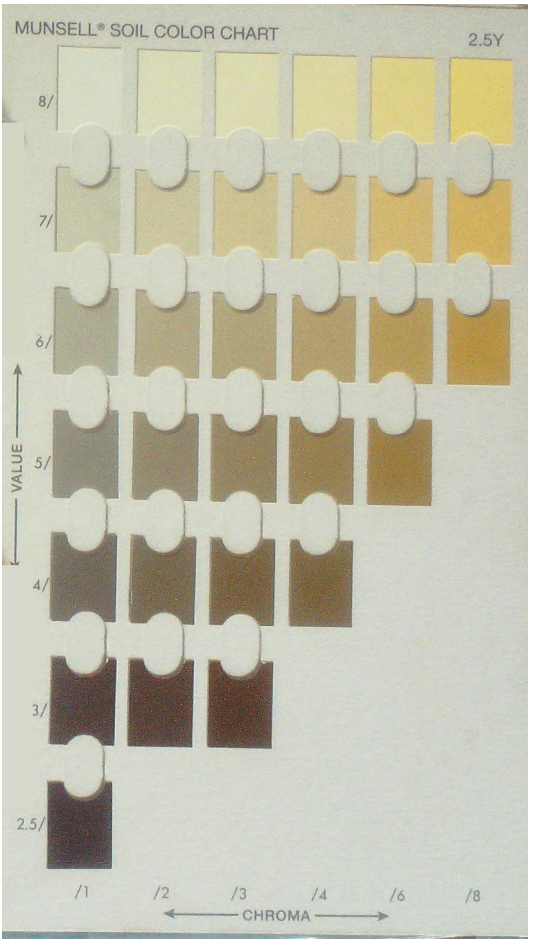

HUE 10YR
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2/
VALUE
8/1
white
8/2
8/3
very pale brown
8/4
8/6
yellow
8/8
light gray
7/1
7/2
7/3
7/4
7/6
7/8
6/1
gray
6/2
light brownish gray
6/3
pale brown
6/4
light yellowish brown
6/6
6/8
brownish yellow
5/1
5/2
grayish brown
5/3
brown
5/4
5/6
5/8
yellowish brown
4/1
dark gray
4/2
dark grayish brown
4/3
4/4
4/6
dark yellowish brown
3/1
very dark gray
3/2
very dark grayish brown
3/3
dark brown
3/4
3/6
2/1
black
2/2
very dark brown
/1
/2
/3
/4
/6
/8
CHROMA

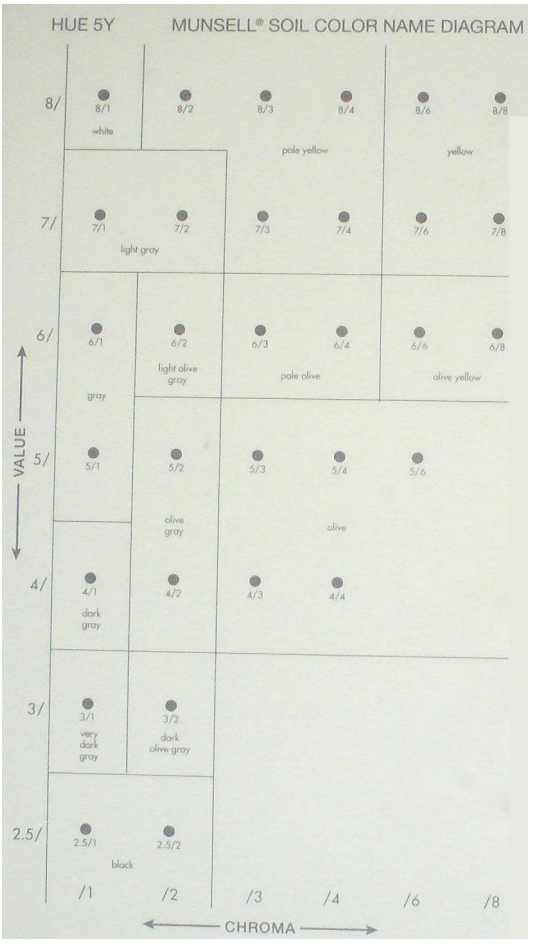

MUNSELL® SOIL COLOR CHART
10YR
8/
7/
6/
5/
4/
3/
2/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

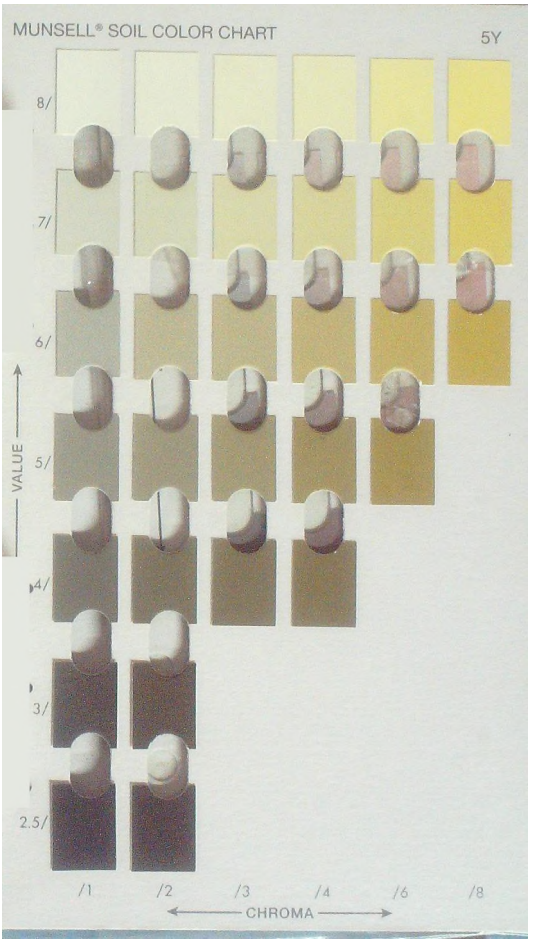

HUE 2.5Y
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
8/1
white
8/2
8/3
8/4
pale yellow
8/6
8/8
yellow
7/
7/1
light gray
7/2
7/3
7/4
7/6
7/8
6/
6/1
gray
6/2
light brownish gray
6/3
6/4
light yellowish brown
6/6
6/8
olive yellow
5/
5/1
5/2
grayish brown
5/3
5/4
5/6
light olive brown
4/
4/1
dark gray
4/2
dark grayish brown
4/3
4/4
olive brown
3/
3/1
very dark gray
3/2
very dark grayish brown
3/3
dark olive brown
2.5/
2.5/1
black
VALUE
/1
/2
/3
/4
/6
/8
CHROMA


MUNSELL® SOIL COLOR CHART
2.5Y
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA


HUE 2.5Y
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
8/3
8/4
pale yellow
8/6
8/8
yellow
7/1
7/2
light gray
7/3
7/4
7/6
7/8
6/1
gray
6/2
light brownish gray
6/3
6/4
light yellowish brown
6/6
6/8
olive yellow
5/1
5/2
grayish brown
5/3
5/4
5/6
light olive brown
4/1
dark gray
4/2
dark grayish brown
4/3
4/4
olive brown
3/1
very dark gray
3/2
very dark grayish brown
3/3
dark olive brown
2.5/1
black
/1
/2
/3
/4
/6
/8
CHROMA


MUNSELL® SOIL COLOR CHART
2.5Y
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA


HUE 5Y
MUNSELL® SOIL COLOR NAME DIAGRAM
8/
7/
6/
5/
4/
3/
2.5/
VALUE
8/1
white
8/2
8/3
8/4
pale yellow
8/6
8/8
yellow
7/1
7/2
light gray
7/3
7/4
7/6
7/8
6/1
gray
6/2
light olive gray
6/3
6/4
pale olive
6/6
6/8
olive yellow
5/1
5/2
olive gray
5/3
5/4
olive
5/6
4/1
dark gray
4/2
4/3
4/4
3/1
very dark gray
3/2
dark olive gray
2.5/1
2.5/2
black
/1
/2
/3
/4
/6
/8
CHROMA


MUNSELL® SOIL COLOR CHART
5Y
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA