Soil Testing for Home Owners

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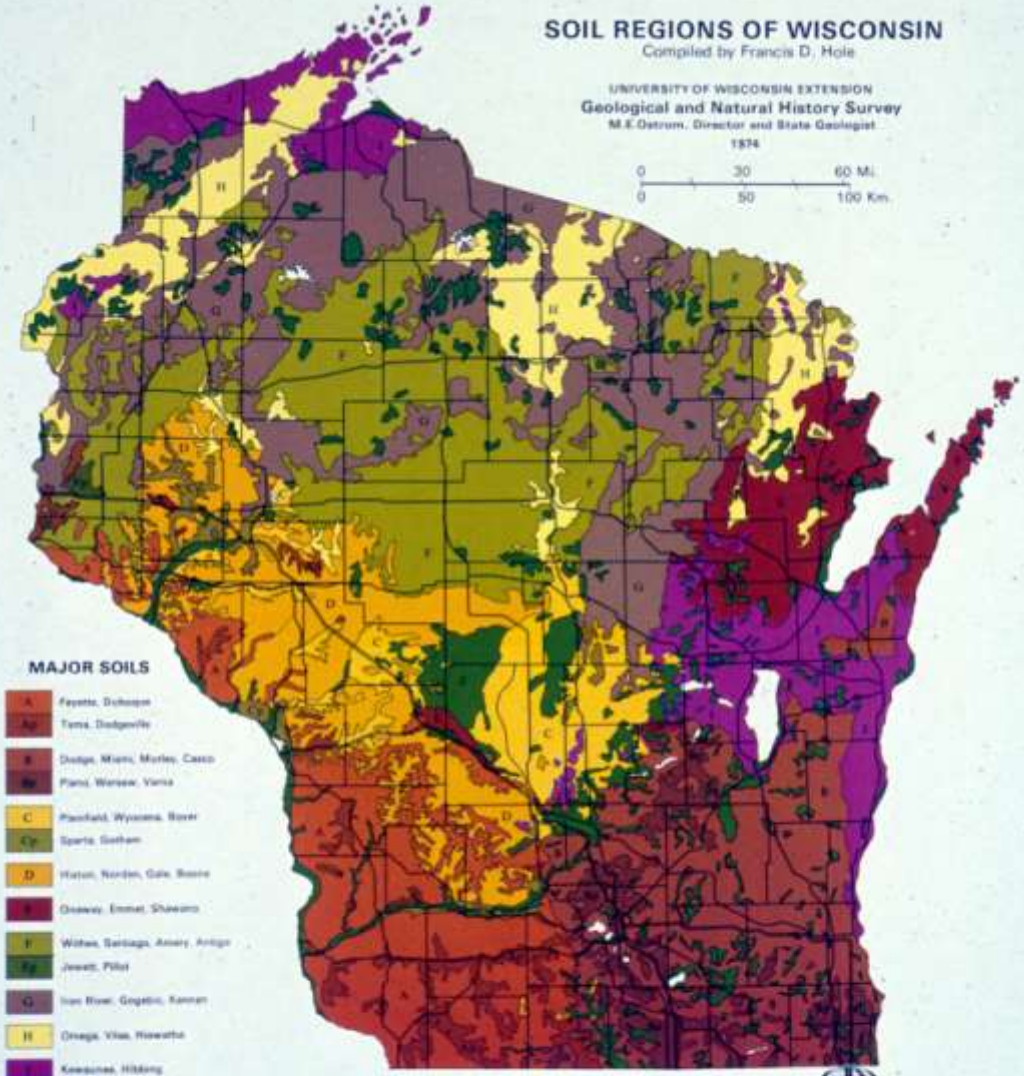
UW Soil Science Department

SOIL REGIONS OF WISCONSIN

Compiled by Francis D. Hole

UNIVERSITY OF WISCONSIN EXTENSION
Geological and Natural History Survey
M.E.Ostrom, Director and State Geologist
1974

0 30 60 Mi.
0 50 100 Km.



MAJOR SOILS

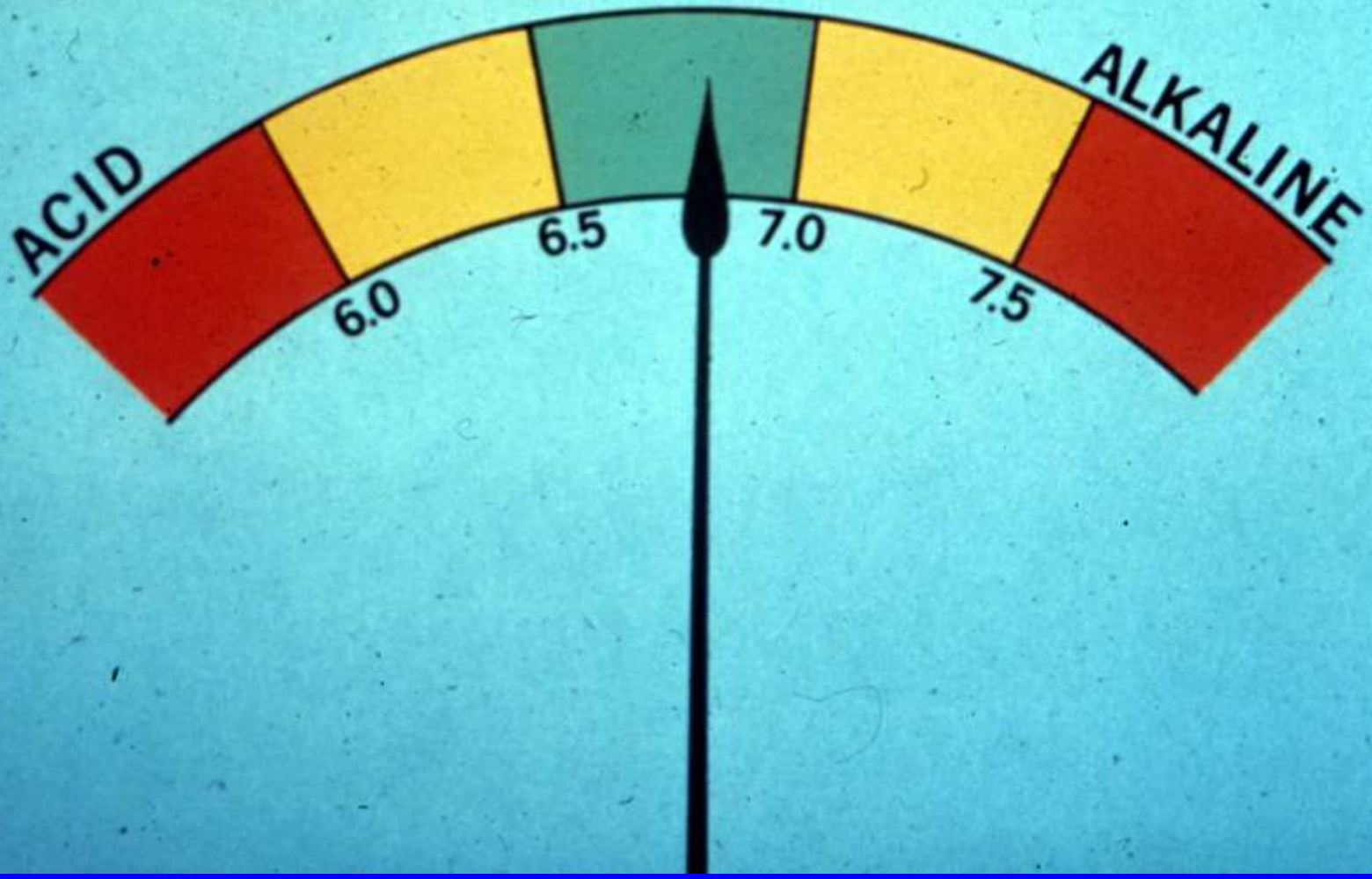
- A — Fayette, Dubuque
- Ap — Tama, Dodgeville
- B — Dodge, Miami, Morley, Casco
- Bp — Plano, Warsaw, Varna
- C — Plainfield, Wyocena, Boyer
- Cp — Sparta, Gotham
- D — Hixton, Norden, Gale, Boone
- E — Onaway, Emmet, Shawano
- F — Withee, Santiago, Amery, Antigo
- Fp — Jewett, Pillot
- G — Iron River, Gogebic, Kennan
- H — Onaga, Vilas, Hiawatha
- I — Kewaunee, Hilbing
- K — Pella, Poygan, Newton, Houghton, Arenzville

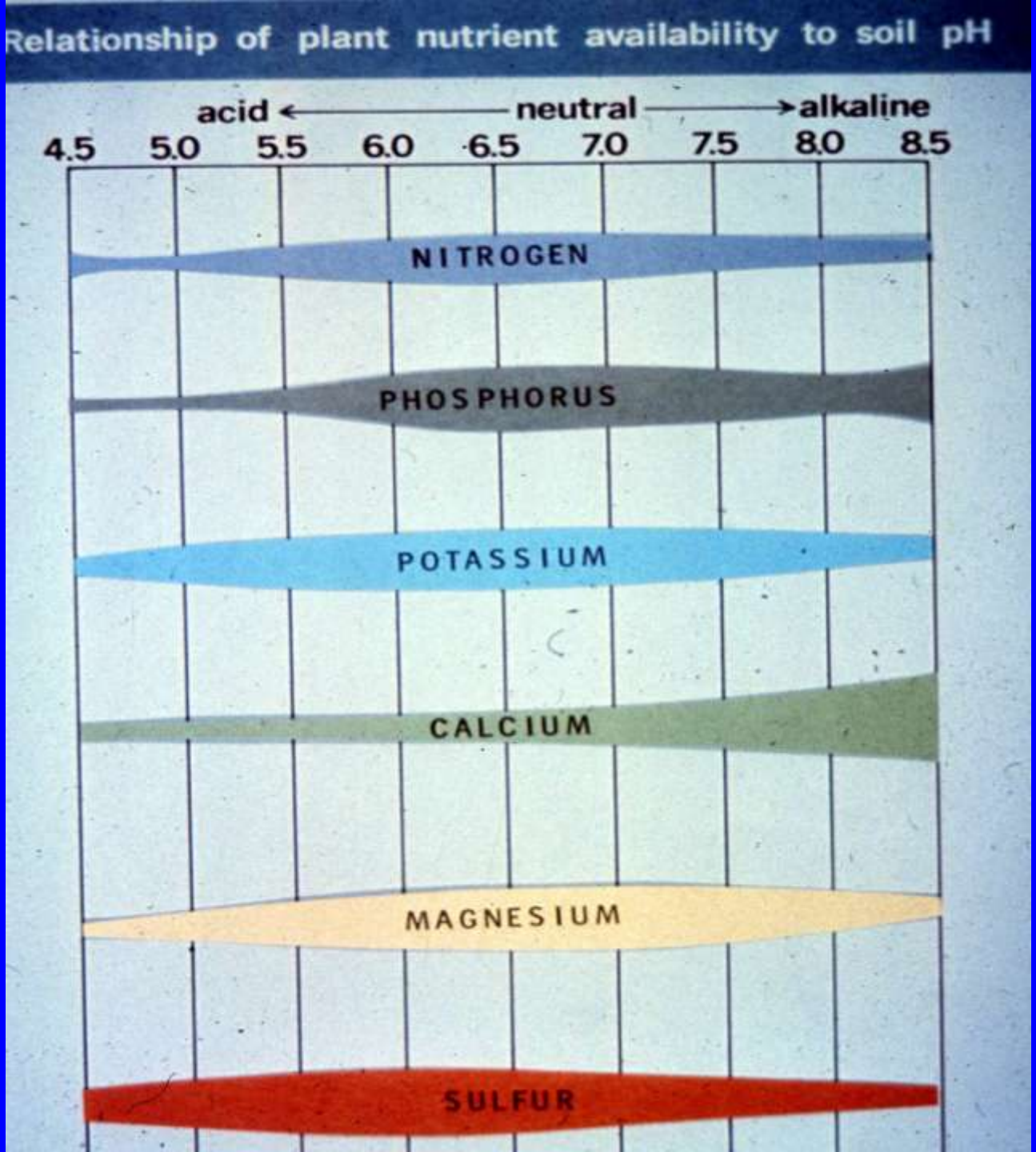
Subscript p (i.e.Ap,Bp) indicates prairie soil

CARTOGRAPHIC LABORATORY, UNIVERSITY OF WISCONSIN

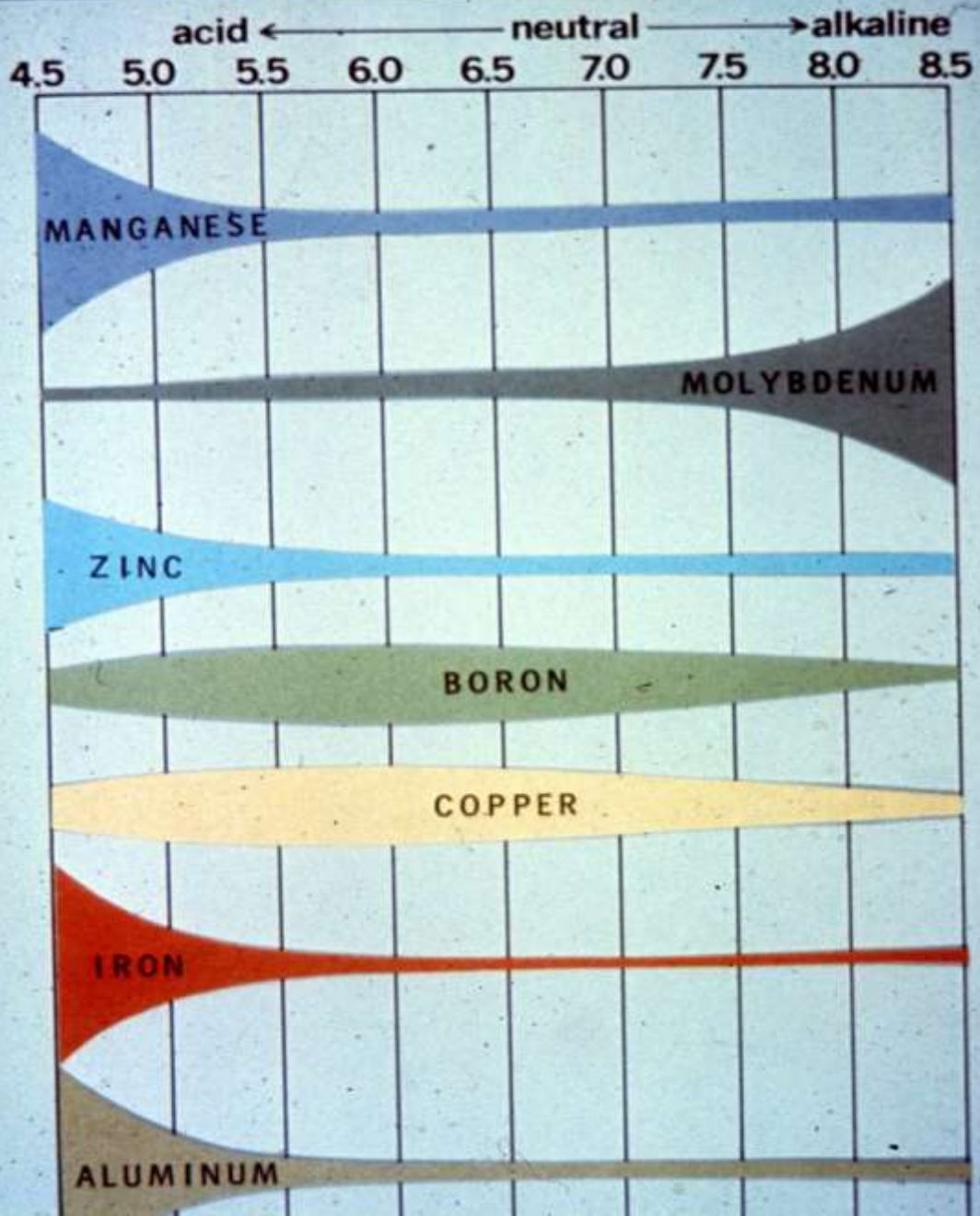
in cooperation with
U.S.Department of Agriculture,
Soil Conservation Service and U.S.Forest Service
University of Wisconsin-Madison,
College of Agricultural and Life Sciences, Department of Soil Science

What is soil pH?

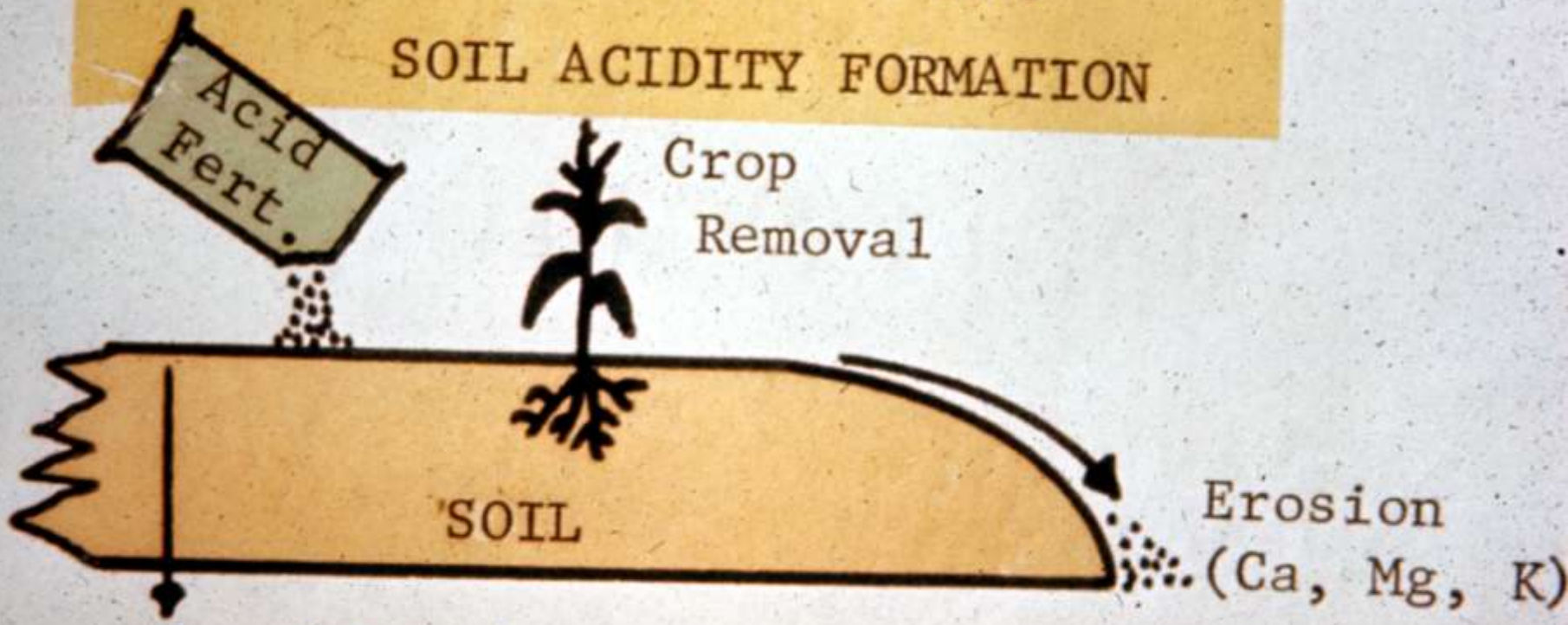



Relationship of plant nutrient availability to soil pH
acid
neutral
alkaline
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
NITROGEN
PHOSPHORUS
POTASSIUM
CALCIUM
MAGNESIUM
SULFUR

Relationship of plant nutrient availability to soil pH

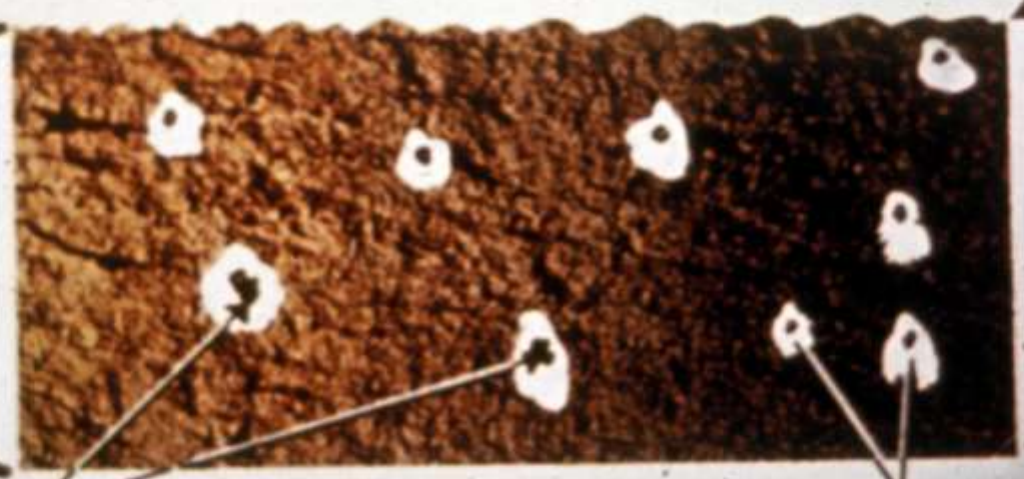


FACTORS AFFECTING SOIL ACIDITY FORMATION



-U.T. Ext. Agron. Dept.-

HOW LIMESTONE WORKS



Particles of Limestone

Areas of acid soil neutralized by Limestone particle

Key steps to obtaining a proper fertilizer recommendation

- Take a good soil sample

Soil Test Report

Samples Analyzed By:
Soil & Forage Analysis Lab
8396 Yellowstone Drive
Marshfield, WI 54449
(715) 387-2523

SOIL TEST REPORT
LAWN & GARDEN

COOPERATIVE EXTENSION
University of Wisconsin-Extension
University of Wisconsin-Madison
Soils Department, Madison, WI

Lab Number: 5456
County: Clark
Date received: 4/29/2003
Date processed: 5/7/2003

Send to:
U.W.

Type of Area/Crop
Garden/Vegetable

Area Designation
Garden

RECOMMENDATIONS

Lime/Aluminum Sulfate to Apply

Apply 11.5 lbs (11.5 cups) 80-89 lime/100 sq. ft.

Broadcast and incorporate recommended 80-89 lime into the upper 6 to 8 inches of soil. It is impractical to adjust soil pH effectively when permanent plantings are established.

Fertilizer to Apply

Phosphate: Apply 0.5 lbs of starter turf fertilizer per 100 sq. ft to meet plant phosphate needs.

Potash: Apply 6.0 lbs of winterizer turf fertilizer per 100 sq. ft to meet plant potash needs. This amount should be split over 3 years.

Nitrogen: Apply 0.8 lbs of regular turf fertilizer per 100 sq. ft to meet plant nitrogen needs.

Most plants require at least an annual nitrogen application, but recommended phosphate and/or potash fertilizers should only be applied once (unless stated otherwise) and soils retested in 2-3 years to determine if more is needed.

Several types of general use (high nitrogen), starter (high phosphate) and winterizer (high potash) fertilizer blends are available. Avoid 'weed and feed' or crabgrass inhibitor types.

Use of starter and winterizer turf fertilizer will increase available phosphorus and potassium to levels optimum for plant growth and supply some needed nitrogen.

Cultural and Management Tips

If lime has been applied in the last 2 years, more lime may not be needed due to incomplete reaction.

Soil tests indicate that phosphate and/or potash fertilizers are needed. Broadcast and incorporate recommended materials into the upper 6-8 inches prior to planting or topdress to established areas and water in thoroughly.

Improve marginal soils that may be 'heavy' and poorly drained, or sandy and excessively drained by adding organic materials such as compost, grass clippings, leaves, rotted manure, or peat moss. Annual applications dug into the upper 6-8 inches will maximize improvement.

Leafy vegetables, sweet corn, tomatoes, and vine crops may require additional nitrogen at flowering. Place about 1 oz (2 Tbl) urea or 4 Tbl of a high nitrogen turf fertilizer in a band at least 3 inches from the plant. Use 1.5 lbs (3 cups) urea or 3 lbs (6 cups high nitrogen turf fertilizer) for every 100 ft of row.

Other Information and Resources

See UWEX A2306 'Calibrating and Using Fertilizer and Lime Spreaders'.

This soil is a silt loam or loam.

See UWEX A2305 'Organic Soil Conditioners' and North Central Regional Extension Publication 295 'Soil Conditioners'.

See UWEX Publication A2304 'Garden Fertilization'.

For further explanation contact your County Extension Office.

Publications can be obtained by contacting the UW Extension Publications office, (608) 262-3346 or (877) 947-7827. Publications may also be available through your County Extension Office.

TEST INTERPRETATIONS

LABORATORY ANALYSIS

Sample	pH	Organic Matter %	Phosphorus [P] (ppm)	Potassium [K] (ppm)
1	5.6	3.3	35	130

Nutrient Recommedations

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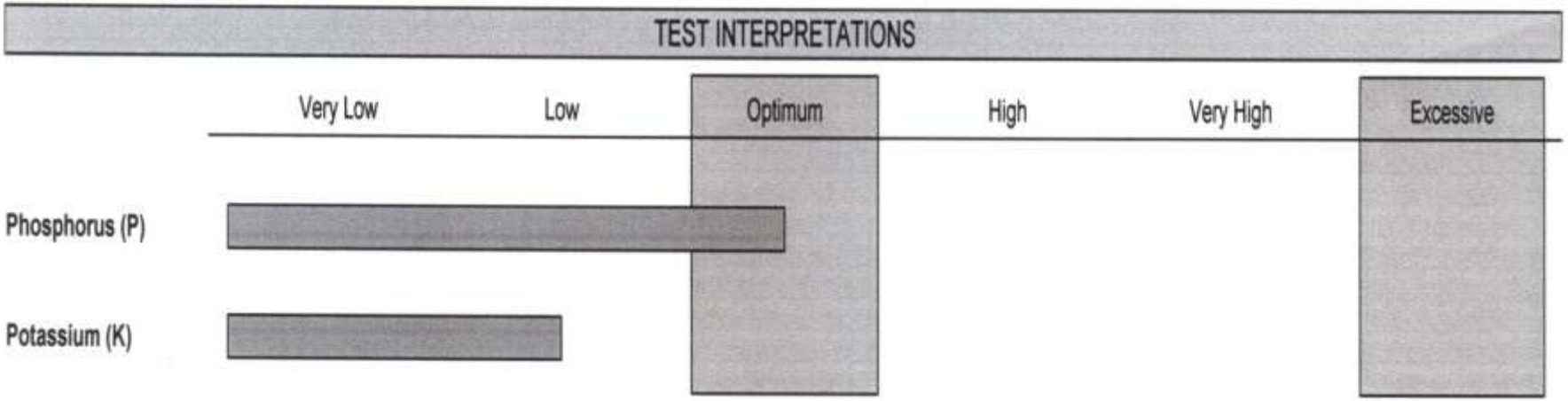
Graphic Interpretation and Lab Results



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UW-SPAL LaG 0.9.4 LAB'S COPY page 1

Additional Tips

Cultural and Management Tips

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Other Resources Available

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P_2O_5 & K_2O or P & K

- Grades for P and K are expressed as oxides, rather than on elemental basis
- Fertilizer recommendations are also given on oxide basis
  - lbs P_2O_5 / 100 ft^2 or 1000 ft^2
  - lbs K_2O / 100 ft^2 or 1000 ft^2
- P and K in fertilizer not actual present as P_2O_5 or K_2O
  - Plants do not actually use P_2O_5 or K_2O
  - Oxide forms are used only to indicate amounts of P and K in fertilizer

Nutrient Forms

Elemental Name	Elemental Symbol	Oxide Name	Oxide Symbol	Plants Use
Phosphorus	P	Phosphate	P_2O_5	$H_2PO_4^-$
Potassium	K	Potash	K_2O	K^+

Fertilizer Grades Example

- Useful in determining application rates
- Minimum guaranteed amounts of available N, P_2O_5 and K_2O in fertilizer

30 – 3 – 3

N – P_2O_5 – K_2O

Calculated on a % of total weight basis

Fertilizer Types

- Mixed Fertilizer – contains more than one of the three major nutrients (ie 18-46-0)
- Complete Fertilizer – contains all three of the major nutrients (ie 6-24-24)
- Straight Fertilizer – contains only one of the three major nutrients (ie 46-0-0)

Examples of Various Types of Lawn Fertilizers

- Regular or High Nitrogen (N)
  - 30-3-3, 27-3-6, 19-4-4,
- Starter or High Phosphate (P_2O_5)
  - 9-19-9, 17-26-6, 9-13-7
- Winterizer or High Potash (K_2O)
  - 10-16-20, 22-4-14

What is Needed

- Phosphate Recommendation – 0.5 lbs starter turf fertilizer per 100 sq. ft. (apply once)
- Potash Recommendation – 6.0 lbs winterizer fertilizer per 100 sq. ft. (split over 3 years)
- Nitrogen Recommendation – 0.8 lbs regular turf fertilizer per 100 sq. ft. (apply annually)

What is Needed

- Lime Recommendation – 11.5 lbs (cups) 80-89 grade Aglime per 100 sq. ft. (apply once)

  Allow three years to fully equilibrate
- Retest in about three years.

Summary

- Take a good (representative) soil test
- Apply lime and fertilizer as needed
- Use a readily available nutrient source to meet the requirements indicated on the report