



University of Idaho
Extension

SOIL PROBES & SOIL TESTING PROCEDURES



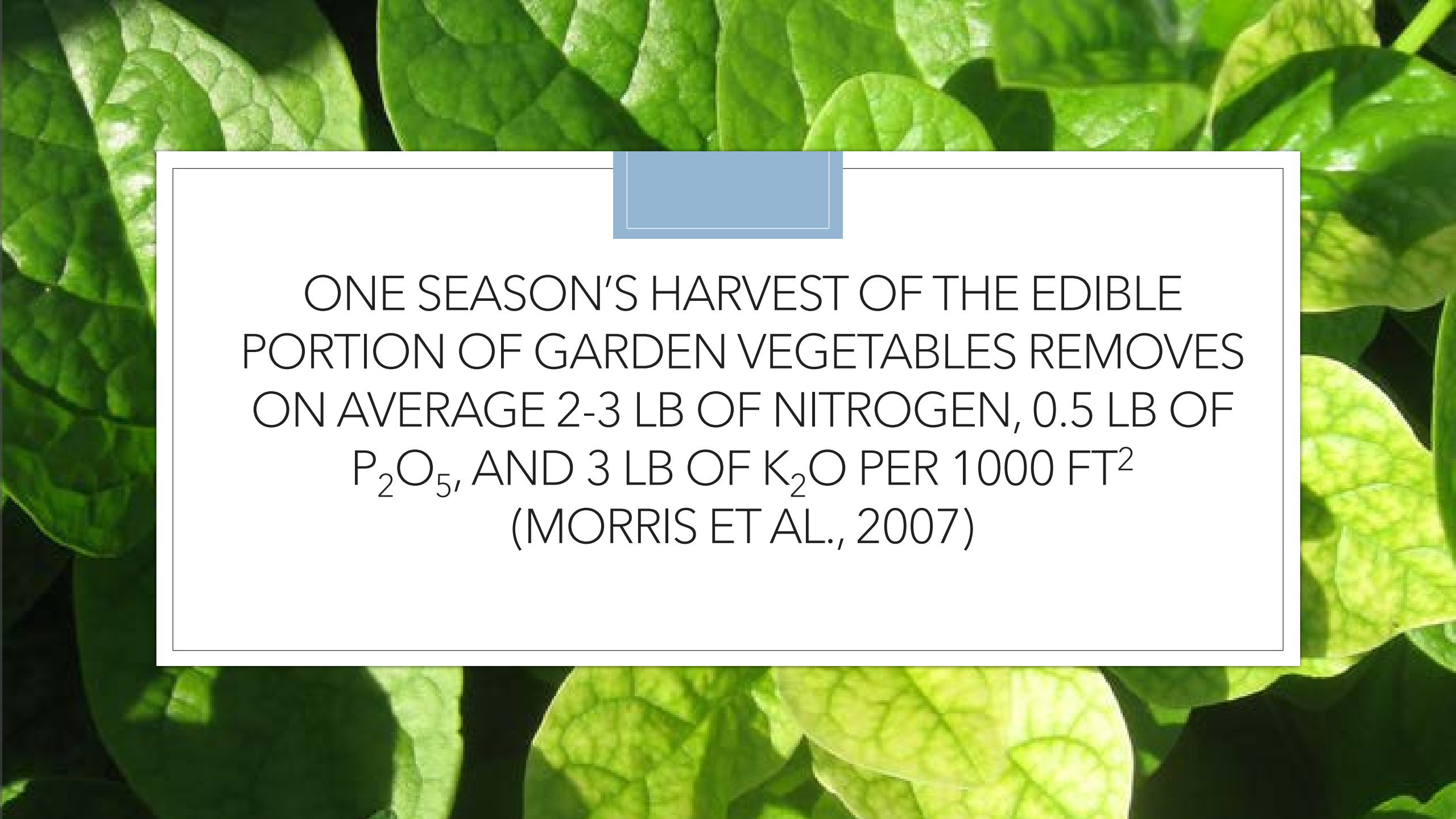
KATE PAINTER
BOUNDARY COUNTY
kpainter@uidaho.edu



Classic potassium deficiency

Why do we test our soils?

- We may be wasting our time and money if we do not know what our soil needs for optimal production
 - Gardening/farming efforts will be less productive if they lack the nutrients needed for optimal production
 - Fertilizer purchases may be incorrect, supplying nutrients that are not needed, wasting money and possibly contributing to non-point source pollution



ONE SEASON'S HARVEST OF THE EDIBLE
PORTION OF GARDEN VEGETABLES REMOVES
ON AVERAGE 2-3 LB OF NITROGEN, 0.5 LB OF
 P_2O_5 , AND 3 LB OF K_2O PER 1000 FT²
(MORRIS ET AL., 2007)

When should you test your soil?

- Testing as close to the time of fertilizer application is best
- Spring testing will tell you what you need to apply for your intended crops
- Fall testing can tell you what needs to be replaced
- Testing over time will tell you how your soil is changing
 - Organic matter levels
 - pH

How many samples do I need?

Table 1. Number of samples recommended for a representative composite sample based on field size.*

Field size, acres	Recommended number of samples
<5	15
5–10	18
10–25	20
25–50	25
>50	30

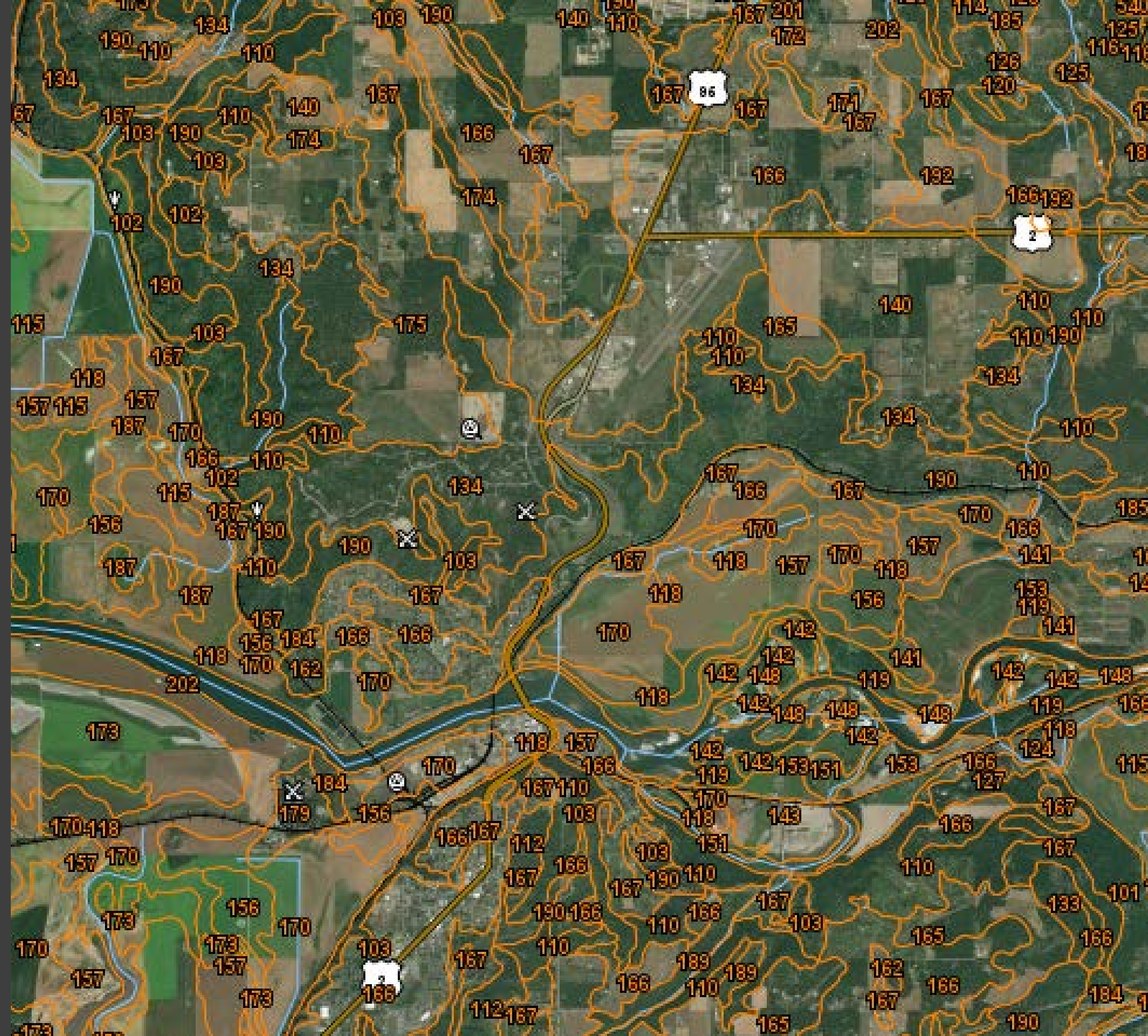
*An absolute minimum of 10 samples from each sampling unit is necessary to obtain an acceptable sample.

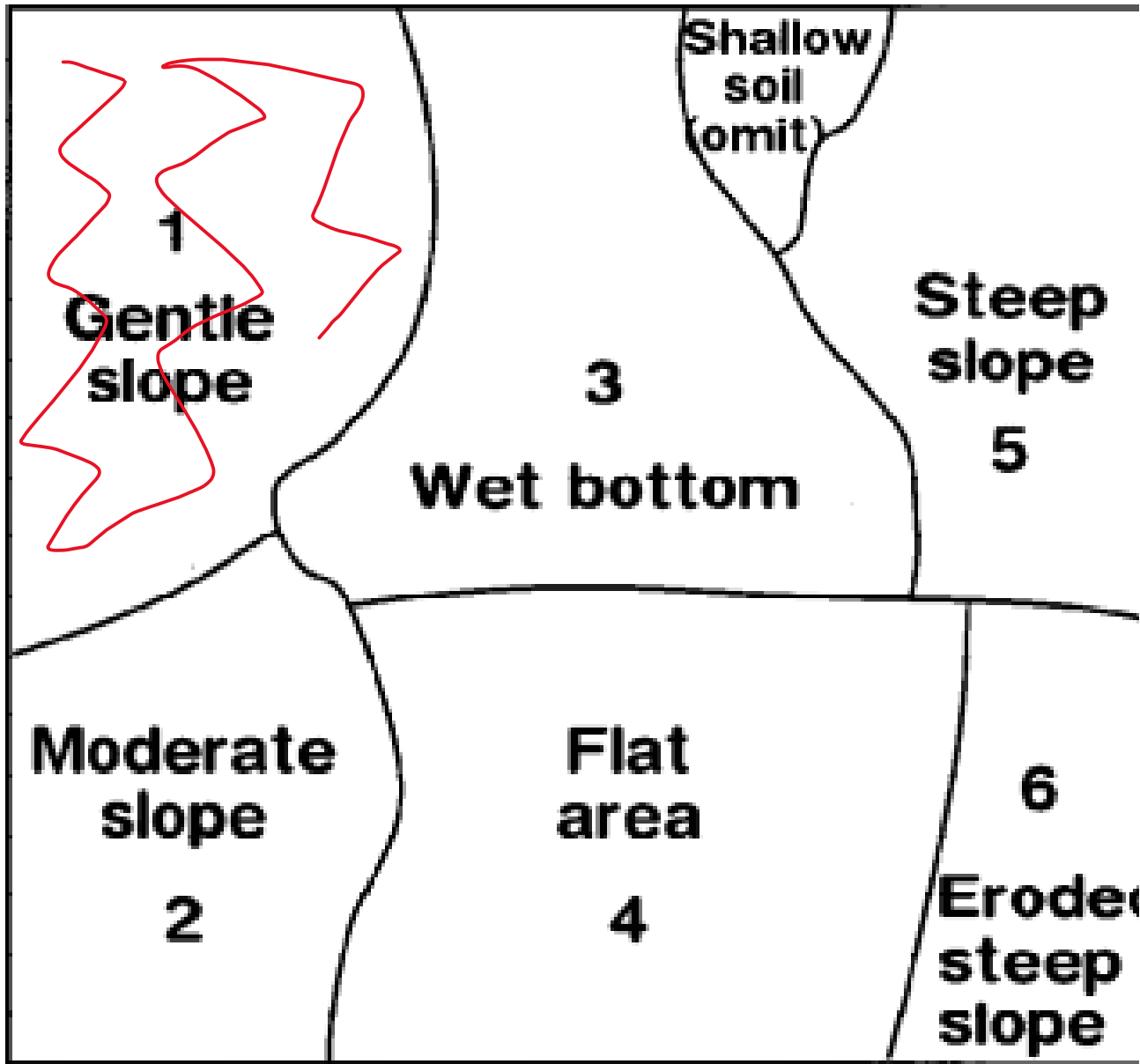
Source: Walsh, Olga, Robert Mahler, Terry Tindall. *Soil Testing to Guide Fertilizer Management*, BUL 915, University of Idaho Extension, June 2020.



DIVIDE FIELDS INTO SAMPLING UNITS

Any areas of obvious field or soil differences should be sampled separately



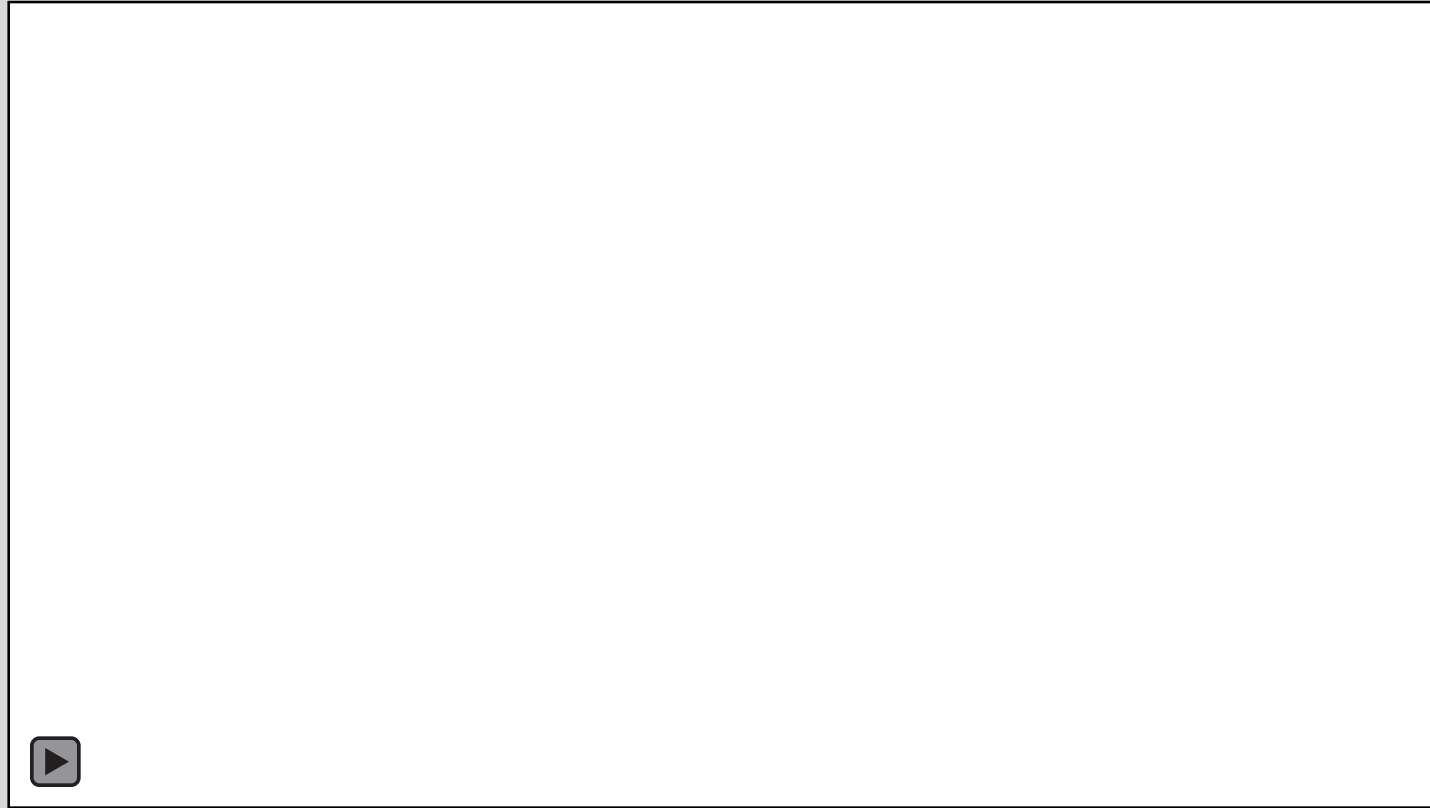


Soil Sampling Procedures

- Any areas of obvious field or soil differences should be sampled separately.
 - Areas of different topography
 - Areas with different crop histories
 - Areas with different fertility
- Plan out a **random path** such as a zigzag through each sampling unit.
- Avoid or discard surface residue.

Fig. 2. A field with areas identified as sampling units.

Using a handheld or step-in probe





Processing your samples

- Using a clean plastic bucket, collect your subsamples from a randomized pattern in your sampling unit.
- Mix all the samples together well, then fill your sampling bag or a baggie and label it.
- As soon as possible, air dry your samples on a plastic surface.
- Alternatively you can freeze them but air drying is preferable.



Choosing a laboratory

- Certified soil laboratories can be found online at <https://www.naptprogram.org/about/participants/all/>.
- We compared a number of different laboratories for price, speed, and recommendations.
 - University of Idaho: \$48, several weeks, no recommendations
 - Stukenholtz: \$38 & up, 48 hours, more data, with recommendations
 - Midwest Laboratories: various packages ranging from \$10 and up; 3 business days, with recommendations
- Prices and service vary considerably. Midwest Laboratories is by far the most reasonable lab and the service is excellent.

	Required Sample Size	Turnaround Time	Price
LAWN TEST	2 cups	3 BD	\$15.00
<p>This test gives a foundation of information that can be useful in dictating which nutrients are available and at what levels of availability.</p> <p>Includes Organic Matter, Nitrate-N, Phosphorus, Potassium, pH, Magnesium, Calcium, Sodium, Soluble Salts, CaCO₃, Buffer Index, Cation Exchange Capacity.</p>			
GARDEN TEST	2 cups	3 BD	\$15.00
<p>This test provides a basic breakdown of the nutrients available.</p> <p>Includes Organic Matter, Nitrate-N, Phosphorus, Potassium, pH, Magnesium, Calcium, Sodium, Soluble Salts, CaCO₃, Buffer Index, Cation Exchange Capacity.</p>			

rapitest[®] Soil Tester

Products for
Successful Gardening™

Plants use Nitrogen, Phosphorus and Potash (N, P and K for short) for healthy growth. Nitrogen is directly responsible for healthy green leaves. Phosphorus is vital for a strong, supportive root system. Potash is essential for flower and fruit development. Plants also require the correct pH level (the relative amount of hydrogen in a substance) to control how they utilize the Nitrogen, Phosphorus and Potash available to them. All plants have a pH preference, so it is important to know the pH level of your soil. You can then choose plants with the same pH preference, or change the pH to meet the requirements of the plants in your garden.

pH Chart

pH 8.0
Alkaline

pH 7.0
Neutral

pH 6.0
Acid

pH 5.0
Very Acid

Plant Food Chart

Nitrogen

Phosphorous

Potash

High

High

High

Medium

Medium

Medium

Low

Low

Very Low

Cluster Leaf P

220 Techcour
Woodstock, Ill
Assembled in U.S.
and domestic par



Rapid Test Kits

- Approximately \$10 for 2 samples
- Results are difficult to discern
- Scientific studies indicate these test kits are not comparable to laboratory results
- Not worth the expense!

Resources

- Dinkins, C.P., C. Jones, and K. Olson-Rutz. *Home Garden Soil Testing & Fertilizer Guidelines*. Montana State University MT200705AG, 2017 (Rev.).
- Fery, M. and E. Murphy. *A Guide to Collecting Soil Samples for Farms and Gardens, EC628*. Oregon State University, 2013 (Rev.).
- Mahler, Robert. L., and Terry A. Tindall. 1997. *Soil Sampling*. Reprint ed. University of Idaho Extension, Bulletin 704. 8 p. <http://sccd.org/EXT0704.pdf>
- Walsh, Olga, Robert Mahler, Terry Tindall. *Soil Testing to Guide Fertilizer Management*, BUL 915, University of Idaho Extension, June 2020. Available online at: <https://www.extension.uidaho.edu/publishing/html/BUL915-Soil-Testing-to-Guide-Fertilizer-Management.aspx>