



**Too Much of a Good Thing:
Finding Balance in
Considering Soil Health
Methods and Products**

Ellen Polishuk




Flower photos by Barbara Lamborne of
Greenstone Fields in Virginia



Soil Health

The continued capacity of the soil to function as a vital living system that sustains plant, animal and human health.



A Healthy soil is one that can quickly recover from disturbance – tillage, weather events, etc.

Who am I and What is My Intention

I am a biological farmer and farm coach

This talk is aimed to commercial farmers = those engaged in an economic enterprise of growing plants/crops for money

My Intention is to give you tools and information to make the best decisions for your business, your soil and your life.

Where are things getting a little whacky?

In my
Opinion....

Misuse/misrepresentation and dogmatic fervor of No-Till

Overuse/Misuse of Compost

Eschewing of Fertilizers

Over Elevation of Lotions, Potions and Salves



In my
Opinion....

Why are things getting a little whacky?

**Pendulum Swinging from decades of
abusive farming**

+

**the speed and effectiveness of modern
communication methods (YouTube,
Instagram, Facebook, On-line Courses)**

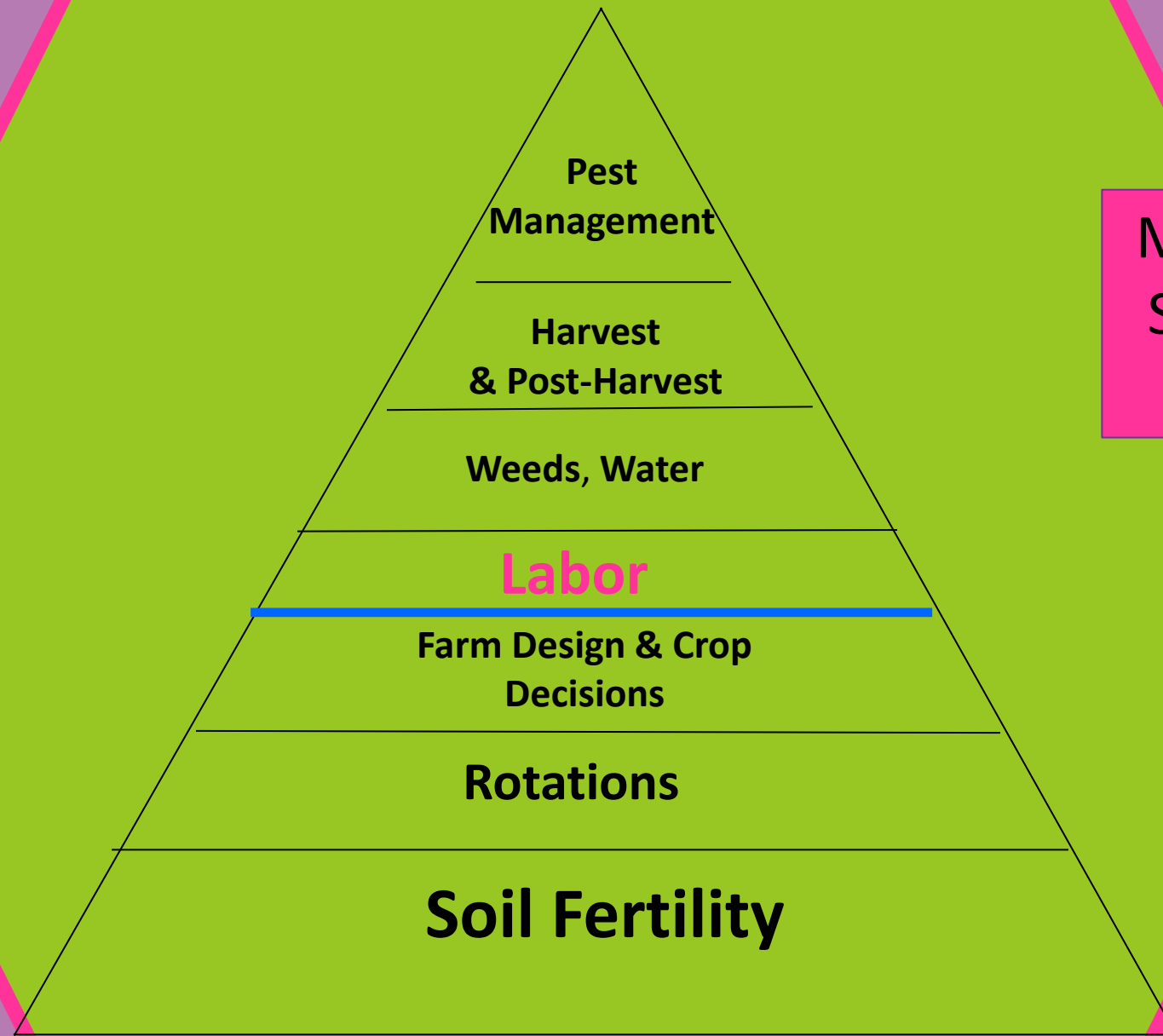
+

**our never-ending desire for someone
to give us THE solution**



Farm Systems
Hierarchy of
Importance

Marketing Plan
Surrounds the
Farming Plan



Diversity = Balance = Sustainability

A photograph of a rural landscape featuring a tractor in a field. The tractor is orange and black, moving away from the viewer on a path of green grass. To the left, there are rows of tilled soil covered with black plastic mulch. The background shows a line of trees and a clear sky. A purple rectangular box with white text is positioned in the upper right, and a light purple rectangular box with black text is in the lower left.

5 rules for maintaining soil health

1. Test and balance soil nutrients, add what's missing
2. Till thoughtfully and gently
3. Keep adding Organic Matter
4. Keep the soil covered as much as possible, preferably with living plants
5. Rotate crops

Whacky Situation #1

Misuse/misrepresentation and dogmatic fervor of No-Till

**You Gotta Earn the Right to go
(truly) No-Till
And
Scale Makes a Big Difference**

Whacky Situation #2

Overuse of Compost

Is 50 tons per acre per year of compost really a good idea?

How long can you do that?

What might go wrong?

Shite Compost WARNINGS:



Not All Compost is Created Equal

- It wasn't really aerobic compost!
 - Disease inducing vs. disease suppressing qualities
- Unfinished compost can be toxic to plants
 - Disease inducing vs. disease suppressing qualities
- Undecomposed woody products may steal Nitrogen from you crops! (like all of it...)

Whacky Situation #2 Overuse of Compost-short term issues

**LOTS AND LOTS of BAD
Compost is a Problem**



**Crop is starved of N etc
AND
This compost is too salty!**



Compost is NOT soil! You can't grow straight into it

And

Hydrophobic woody compost = not enough structure for roots to hold on

Whacky Situation #2

Overuse of Compost-long term issues



After 7-9% OM – It is no longer “soil”, it is a growing medium. Like greenhouse soilless media. And

The rules of farming don't really work anymore.

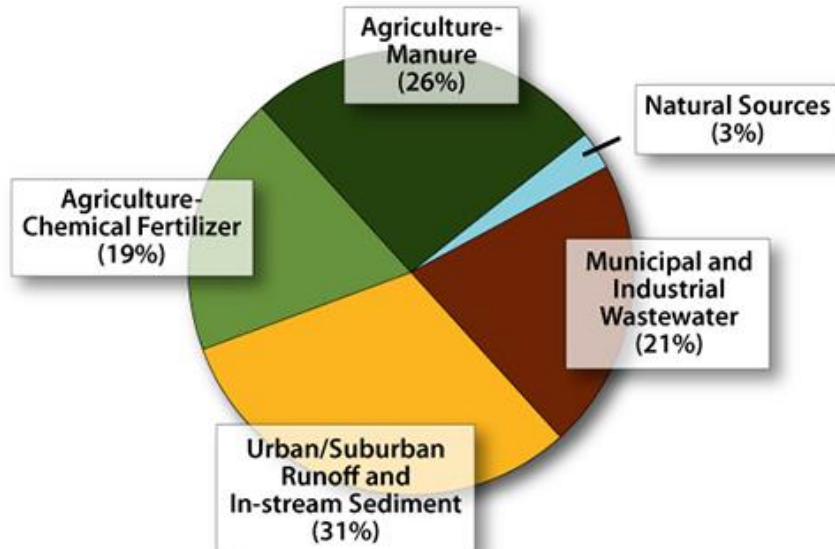
Singing Frogs Farm suggests that OM over 7-9% is problematic
I've seen soils testing over 10% OM and crops are suffering

**You will become a Point source of Phosphorus
Pollution**

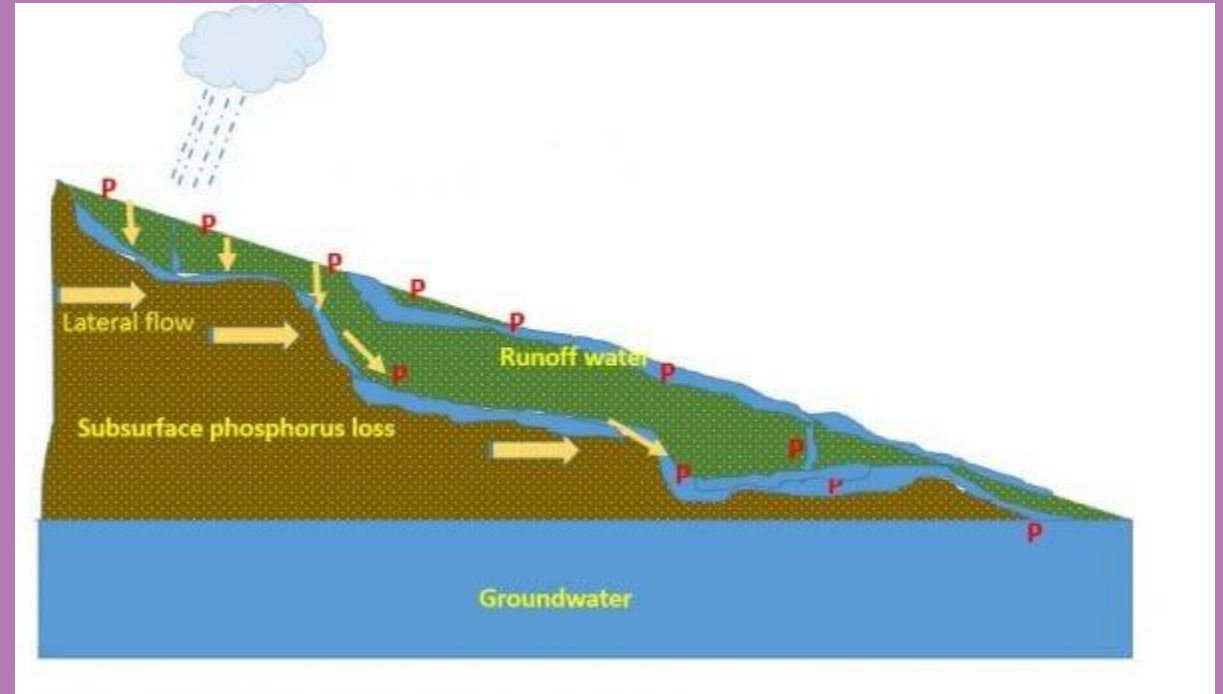
**And Your soils will test high for Phosphorus for
decades**

What's up with Phosphorus pollution? I thought only "chemical" phos was a pollution issue?

Sources of Phosphorus to the Bay



Note: Does not include loads from the ocean, tidal shoreline erosion, or direct atmospheric deposition to tidal waters. Wastewater loads based on measured discharges; other loads are based on an average-hydrology year using the Chesapeake Bay Program Watershed Model Phase 4.3 (Chesapeake Bay Program Office, 2009).



When Phos levels go over 350ppm you are directly polluting groundwater
State of MD will begin to limit your fert usage at 150 ppm

What is the role of compost?



What's so great about (good) compost?

- Nutrient delivery system – doles them out as the plants need them
- Organic matter addition – **stable** carbon
- Inoculates soil with beneficial microbes
- Helps neutralize soil toxins and harmful compounds
- Physical soil improvement (not REPLACEMENT)



Using Compost vs other fertilizers?

Pros

- It's simply a great fertilizer
 - Biologically
 - Chemically
 - Physically
- Great carrier for other amendments/nutrients
- Feels *GOOD* to use

Cons

- Cost \$\$\$
- Spreading is a lot of work without proper equipment
- Does not replace need for other amendments
- Too much = pollution and problems

Sustainable Compost Usage??

Soil Building Phase = how much time and money do you have? Up to 50t/acre a couple times?

Maintenance Phase = up to 10t/ac

Soil Replacement Situation = no more than 1/3rd the volume of soil medium.



Whacky Situation #3

Eschewing Fertilizers

**Can you reliably grow good
quality and quantity of crops
without using imported
amendments?**

Farming is not “natural”

In natural systems (almost) nothing LEAVES
The circle is complete

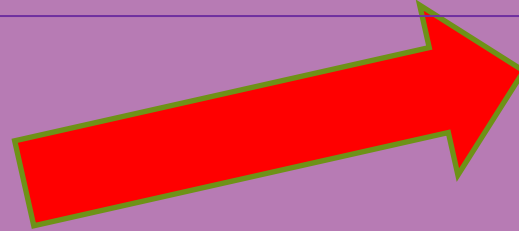
Our cycle is fundamentally broken because our farming systems are a one-way street:
Nutrients are Exported, nothing comes back



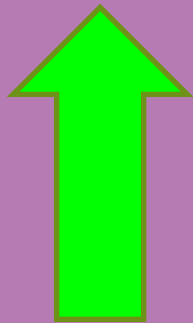
Your Farm



EXPORTING Nutrients to your customer

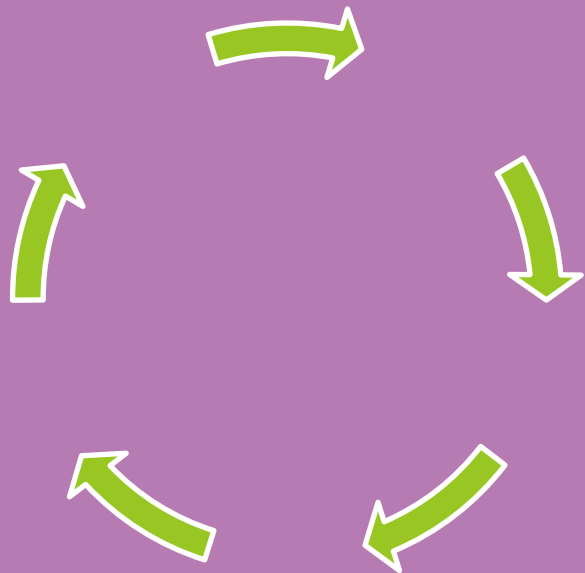


IMPORTING Nutrients: From where?

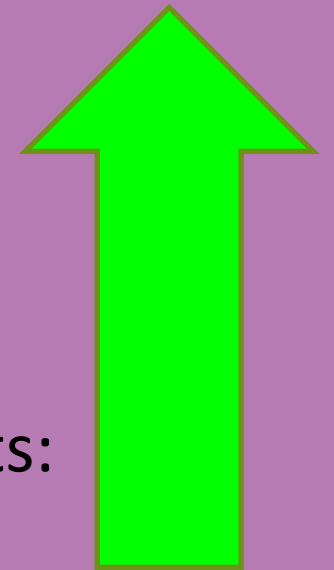


Think about your Cycle and do
your Best

Your Farm



IMPORTING Nutrients:
From where?



Whacky Situation #4

Over Elevation of Lotions, Potions and Salves

Is fermented egg shell solution really what you've been missing in your farm operation?

Cake and Icing



Make sure you cover the “Basics” before you wander off into the minutiae

the Biggest little Farm



Cake and Icing, continued

- IF money was no object, what could you do with an abandoned degraded soil?



**How Do You Know if your efforts are
Succeeding?**

How do you know if your soil is Healthy?



How about Great Crops?

Low insect/disease impacts

Strong stems

High yield



A Healthy Soil

Is a vital living system that sustains plant, animal and human health.

A healthy soil is one that can quickly recover from disturbance – tillage, weather events, etc.

What Might You see with a healthy soil?

Easy Water
infiltration =
no ponding

Quick
breakdown of
residues

Good Tilth
(easy to work)

Worms,
castings, and
tunnels

No Erosion
(clean water
leaving field)

Bright white
roots with soil
clinging like fur

A photograph of a rural landscape. In the foreground, there is a lush green field of grass. In the middle ground, a red tractor is driving away from the viewer on a dirt path. To the left of the tractor, there are rows of tilled soil covered with black plastic mulch. In the background, there are rolling green hills and a line of trees under a clear sky. A purple rectangular box with white text is overlaid on the right side of the image.

5 rules for maintaining soil health

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Rule #1

Soil Test and Apply What's Missing



What you need to learn from the soil test?



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Main 901.213.2400 ° Fax 901.213.2440
www.waypointanalytical.com

"Every acre...Every year®"

SOIL ANALYSIS

Client :	Grower :	Report No: 21-025-1014
		Cust No: 27042
		Date Printed: 01/29/2021
		Date Received : 01/25/2021
		PO:
		Page : 1 of 5

Lab No: 46681

Field:

Sample ID: Field CF

Test	Method	Results	SOIL TEST RATINGS					Calculated Cation Exchange Capacity
			Very Low	Low	Medium	Optimum	Very High	
Soil pH	1:1	6.2						3.6 meq/100g
Buffer pH	SMP	6.89						%Saturation
Phosphorus (P)	M3	6 ppm						%sat meq
Potassium (K)	M3	23 ppm						K 1.6 0.1
Calcium (Ca)	M3	497 ppm						Ca 69.0 2.5
Magnesium (Mg)	M3	69 ppm						Mg 16.0 0.6
Sulfur (S)	M3	6 ppm						H 11.1 0.4
Boron (B)	M3	0.1 ppm						Na 1.6 0.1
Copper (Cu)	M3	0.5 ppm						K/Mg Ratio: 0.10
Iron (Fe)	M3	68 ppm						Ca/Mg Ratio: 4.31
Manganese (Mn)	M3	51 ppm						
Zinc (Zn)	M3	2.0 ppm						
Sodium (Na)	M3	13 ppm						
Soluble Salts								
Organic Matter	LOI	2.2% ENR 88						
Nitrate Nitrogen								

SOIL FERTILITY GUIDELINES

Crop : Annual Flowers

Yield Goal : 1

Optimum

Rec Units:

LB/1000 SF

(lbs)	LIME	(tons)	N	P ₂ O ₅	K ₂ O	Mg	S	B	Cu	Mn	Zn	Fe
20			3.0	3.0	3.0	0	0.20	0.02	0.10	0	0	

Crop :

Rec Units:

- CEC
- OM
- pH
- Nutrient Levels
- Nutrient Balance

Apply What's Missing Big Time = Major Soil Corrections



Get the pH correct with Lime



Big Phosphorus Additions

Annual Crop Fertilizer = replacing the nutrients that are leaving your farm

- Mineral fertilizer (dry blend)
- Cover crops and green manures
- Compost or Manure
- Liquid Fertilizer



What the soil test does not tell you

- What form are those minerals in?
- Biology – who's there to help feed the plant?
- Physics –
 - is the soil soft and crumbly so that roots can grow and reach the nutrients?
 - can the microbes breathe?



Tillage!

**Rule #2
Till with Care**



Rules #3 and #4
Keep the Soil Covered AND
Continually Add Organic Matter

Plant cover crops religiously
Grow green manures
Use organic mulches
Spread compost/manure
Incorporate/Use Plant Residues

Rule #5

Rotate crops
(even in your
tunnels!)

Why?

The Many Goals of Crop Rotation

Disease/Insect Prevention
Weed Management
Feeding the Microbes



THANK YOU



STAY IN TOUCH WITH ME:



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