



Nutrient Dense Hugelkulture:

An Experiment in Land Management at Woody End Farm

Goal: Take all of the surplus organic materials on the farm, add essential missing pieces and use them to create useful and productive land. Aim for high productivity of nutrient dense and healthy plants and animals with the least amount of maintenance possible. A tall order!

The Challenge:

- Mid 1700's family farm with very poor quality old pastures – grey podsol clay with very low pH (5.2), and not much of anything needed to grow decent crops of any kind except low bush blueberries. N,P,K, Ca, Mg barely register on a soil test.
- Parts of the land are very dry and parts are very wet. There are several dug wells and drainage ditches crossing through the open fields near the house and barn.

Resources (all that surplus organic material and more):

- The ice storm of December 2008 left piles and piles of wood. All tree canopies around the house and fields were shattered. Seven huge piles were burned and still there is wood! All woodsheds are full and still there is wood!
- Manure from 1 horse, 10 goats and 4 ducks. All of the manure is from healthy animals provided with all minerals needed for optimum health. All manure is mixed with wood fiber (shavings or sawdust) and hay.
- Decent quality loam available for purchase in the area – Sterling Peat's peat/loam blend.
- Stone dust that has been observed to grow decent plants – Pandolph Perkins (although a good basalt stone dust might be better)
- Minerals and soil amendments available at Gardner Agway and through wholesale distribution from North Country Organics, VT
- 28 years experience with growing plants, an odd twist of thinking and lots of books!

Take all of these resources and what do you get?

NUTRIENT DENSE HUGELKULTURE BEDS!

Hugelkulture (HK) beds are versions of the mid European concept of mound culture – piling up woody plant material, covering it with compost, manure or other organic material and planting in the middle of it. It could also be looked at as a take off on the concept of nurse logs – burying logs near stressed trees in order to provide both a source of nutrients for beneficial fungi associated with trees and water for both the fungi and the tree roots as the logs decay.



Nutrient Dense Farming is way of looking at food production that maximizes the health of the food produced and thereby increases the health of who ever eats that food. It uses the tenets of organic, ecological, biological, bio-dynamic, re-mineralization and other kinds of farming & gardening to produce the best quality food and it documents that vitality through independent tests like brix readings – other test instruments coming soon.

The HK beds at Woody End Farm start with the basic mound approach and add the concepts of nutrient density crop growing to create (we hope!) biologically active, water managing, minerally dense, low maintenance beds. We'll use some direct investment in materials (loam, minerals etc) a minimum investment in equipment (hired use of a tractor with a front end loader) and with the end result of maximum production level per developed

square foot. The beds should be able to sustain at least two growing levels at a time – double cropping.

What we're using today on and in the HK beds: (This is from the day we built our first bed)

Layer 1: Larger logs – some very large – coated with dolomite (Ca/Mg) limestone (already laid out with lime spread).

Layer 2: Compost – pretty fresh – worked deep into the open areas between the logs – provides the nitrogen for the wood's decomposition and also adds the phosphorus and potassium found in manure. We've been adding calcite lime to the manure as it's cleaned out of the barn or we would be adding it at this point.

Layer 3: More logs – smaller now and worked into the grooves if they still exist – also working to balance the height of the final bed

Layer 4: More manure – mostly composted this time – and we'll add the calcite lime because it's from an older pile that didn't get the lime added during removal from the barn.

Layer 5: Small branches to complete the integration of wood through the bed.

Layer 6: Topsoil – from Sterling peat – their peat/loam blend – at least six inches if we have enough – 4" otherwise.

Layer 7: Stone dust – from Pandolph Perkins – between 1/8" – 1/4" – to help break up the "new loam crust" that always happens and to add that raw mineral component.

Layer 8: Minerals and microbe boosts – alfalfa meal, rock phosphate, greensand, azomite blended together on a tarp (wear a dust mask if necessary) and worked into the loam layer with a cultivator.

Layer 9: Shredded leaves and grass clippings provided by a local landscaper. We won't do this today. They'll be delivered as he cleans down his sites – added as they arrive.

In case you need more information, here are my favorite mineral soil amendments - #8 above

Straight products: - available at Gardner Agway or similar type store

Alfalfa meal, greensand, azomite, calcite lime, rock phosphorus, gypsum, liquid kelp, elemental sulfur, compost.

Blended products: -

- North Country Organic's (NCO) Pro-Gro, Pro-Start, Pro-Boost, Pro-Holly
- Layer mash ~ non-medicated ~ turns out that what feeds a chicken is great for the soil too!
- Ocean Organic's GBS Bio-stimulant
- Neptune's Harvest's Straight Fish and Fish/Kelp blend- especially good on begonias and all vegetables if they need a pick me up. Used it extensively after all of the rain last year

Blended products often needed to be ordered from the wholesale delivery product stream. Layer mash is found at any grain store and Neptune's Harvest is everywhere as well.

Favorite soil management recipes:

Basic planting mix – used in all annual and perennial installations. Rate adjusted by type and vitality of plant material and history of the garden. This is mixed together on a large tarp and stored in sealed plastic containers. I mix about 6 batches a year.

50 lbs NCO Pro Gro
50 lbs Alfalfa meal
20 lbs Azomite

Woody planting mix – developed to try and get ericaceous material to settle in faster but found that it works really well for all woody material – even a bare rooted, 3.5" caliper locust in late May. Prep the roots for planting. Coat the root balls with the mix (work in well with fingers or knife) and work more mix into the top 6" of the soil in a 2'-5' circle around the new tree or shrub (diameter determined by plant selection).

25 lbs Alfalfa meal
25 lbs Jersey Greensand
20 lbs Azomite
and (new this past year) 5 lbs Ocean Organics GBS (Bio-stimulant)

Elemental Sulfur, Gypsum and Rock phosphate are added based on soil test results or known problems on the site.

Fall soil development mix – used in open gardens that are coming in to production, edges of existing gardens that need refreshing or other soils that need to open up (compaction etc.) It's spread on the surface at the rate of about 10- 25 lbs/100 sq ft and either rototilled in if the bed is open or hand cultivated if the bed is already planted – amount is determined by severity of the specific problem. Promotes a strong bacterial reaction and feeds the worms well – they develop heavy muscles (almost blue in color) that allow them to really turn soil. I've also used this at the rate of 50 lbs/100 sq ft when there were severe issues involved. This only works if the beds are empty and it's done in the fall so that the surge of heat that's generated can dissipate before new materials are added – excellent for breaking down 4" of painted wood chip mulch 😊!

50 lbs Layer Mash – non-medicated (chicken food)

50 lbs Greensand

20 lbs Azomite

40 lbs Gypsum

Last year stone dust from a local quarry was added to the mix for a couple of beds where too much organic material had accumulated – results this year are spectacular.

Caveat

Never forget that **your best assets are your eyes and other senses** – tweak these formulas so that they work for you. These were worked out for the central upland area of Massachusetts – essentially Worcester County – and would need considerable adjustment for other distinctly different geographies and soil types. Use soil tests, compaction tests, visual and textural tests and any other source of information you can find to help you unwind the history and the reality of any given soil situation.

I do want to make clear that I am not a soil scientist – or scientist of any kind. I provide complex, integrated and colorful gardens of all kinds for people who love to be out in their gardens and appreciate the diversity that is found there. Over the last 20 years I have tightened down the formulas that I use as the baseline for all of the gardens I manage. It is an intensive program and definitely not for everyone – or even for most people. I have heard from people that I've taught over the years that this program works for them as well. They don't apply it as intensively as I do but the results still work better than anything else that they have tried.

Here's to everyone growing great, healthy, beautiful gardens!

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