Creating the Organic Farm Ecosystem: Challenges and Successes

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Overview

- Since starting Green Gate Family Farm in 2010, we have been employing **strategies** on our certified organic farm to improve and enhance the **farm ecosystem**. To us this means a focus on soil health and biodiversity. Promoting farm ecosystem health is a year round strategy to improve crop health. This requires vigilant observation and taking appropriate, corrective measures. Some of the strategies we have employed to date are cover cropping, crop rotation, low-till/no-till practices, integrating poultry, trap cropping, farmscaping, and permaculture.

Green Gate Family Farm

Purchased 6/01/2010; 60+ acres; orchard, pastures, Wood lot, sloped. Transition to Organic Certification.

Organic tenets, diverse production: annuals, perennials, small fruits and berries; poultry and small livestock.

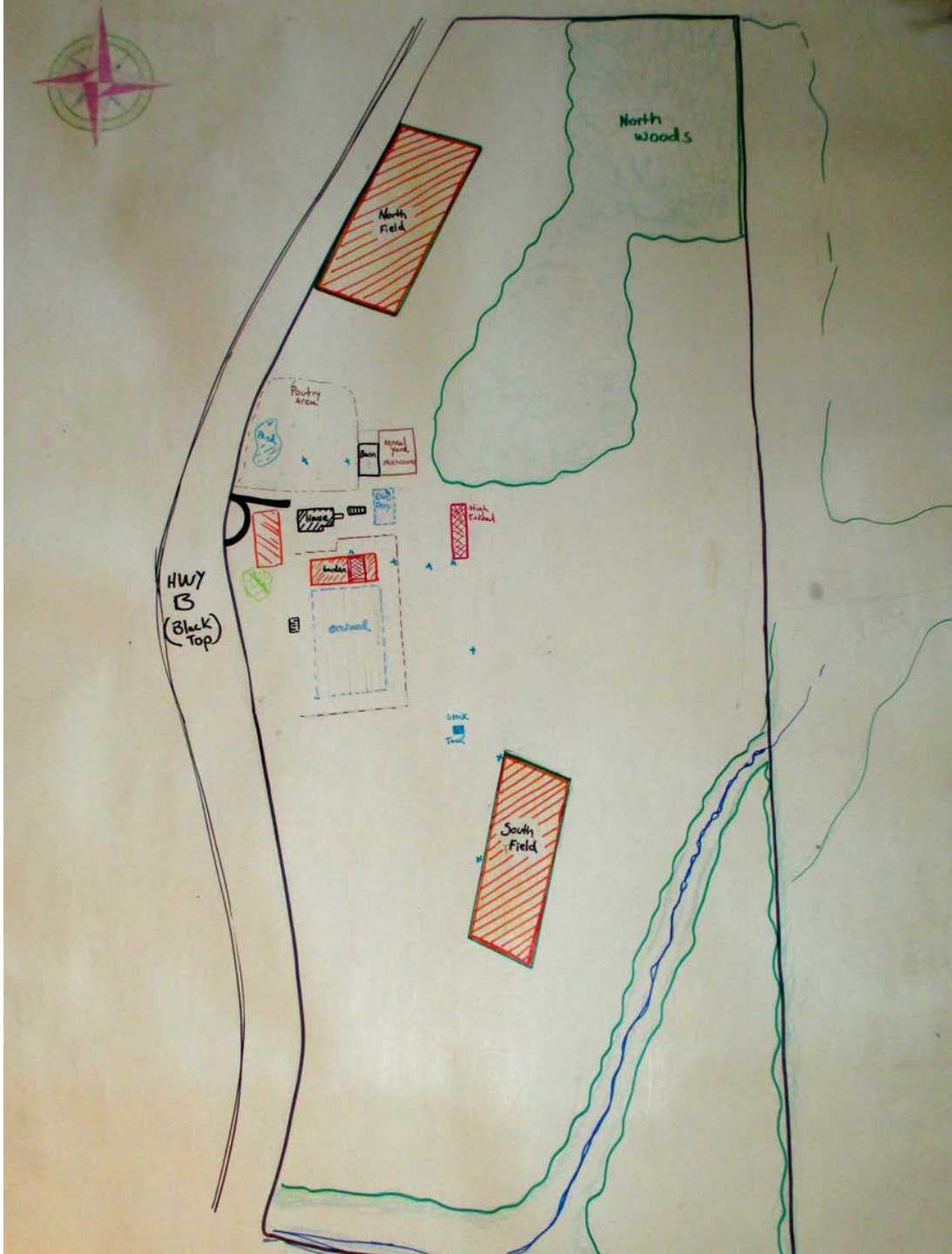
“We met on an Extension Farm Tour!!”

How do you like that “Farmer’s Only.com”!?

Dec 07, 2012- “a day that will live on in infamy!”

GGFF

- West Central Missouri (Hickory)
- 67 acres
- South facing slope
- At the foot of the Ozarks
- Cattle, hay, corn, melons, homestead
- Wood lot
- Seasonal streams



Soil Type

Map Unit Symbol	Map Unit Name
70084	Eldon gravelly silt loam, 3 to 8 percent slopes
70116	Creldon silt loam, 2 to 5 percent slopes
70039	Sacville silty clay loam, 1 to 3 percent slopes
76140	Sacville silty clay loam, 1 to 3 percent slopes, rarely flooded
76421	Racket silt loam, 1 to 3 percent slopes, occasionally flooded

Goals/Business Plans

2011- 1 yr plan (small scale organic produce/poultry); 1 F.M.

2012- 3 yr/ 5 yr plans- continue O. transition; high tunnel;
new well & irrigation system; fencing/poultry.

Ecosystem improvement- surface water protection plan

2013- 3 yr / 5 yr plans- on track: increase production.

Goals- trend towards sustainability. With an $$

Reduce/avoid off farm inputs!

Challenging in the face of shortages: labor, equipment, experience!

Other resources are available (ie- Extension).

Record keeping and financial analysis.

Deficits: Cold storage lacking. GAP certification. Season extension. Better Crop Rotation.

2014- Finished 3 yr plan. 5 yr plan- we are behind schedule!

Production overall up slightly, levels off.

Added: Trap cropping, more cover cropping, insectary plantings.

Greenhouse construction has begun!!

Deficits- Cold Storage! Others??? Yes!!!

Soil Testing

<u>2015</u>- Finish 5 yr plan.
Start new 3 yr plan.

Add small CSA.

Complete Greenhouse.

Formal Trap Cropping.

More Insectary plants.

Expand farmscaping.

Add small ruminant flock:
rotate meat goats, sheep,
poultry.

Equipment- a used Kubota; a few attachments;

- lawn tractor

Methodology- strip spading of grow beds, intercrop strips

No/low Till- Spader aeration

Sub Soil disruption “minimized”

Top layer mixed well; Biomass incorporated; roots broken.

(Tortella model)

Reduced input- less machinery/costs

Still very noisy though!

GGFF- small scale poultry production. Egg sales.

Chickens- 200 layers; Ducks- 75 layers; geese, turkeys.

Manure- Spring/Fall cleanings; bedding. N source!

Organic Production

Aesthetic, ethic, and legal frameworks

Aesthetics of the Organic Farm Lifestyle: is this really a “farm”?

Organic Production

Aesthetic, ethical, and legal frameworks

Ethics of the Organic Farm Lifestyle: Is this a happy farm?

Organic Production

Aesthetic, ethical, and legal frameworks

Legality of the Organic Farm Lifestyle: Is this really an organic farm?

Trade Offs- a lot to wrestle with here

Free Range. Certified Organic Feed only.

“Do your eggs come from happy chickens?”

Free Range has its COSTS!!

Artisanal, free range, organic, hand picked.

Artisanal, free range, organic, hand picked.
Most expensive eggs in KC!

What else, besides eggs?

Season Extension

EQIP cost share; excellent investment;

NOT pest and disease issues free- requires careful planning, attention and rotation; Add insect netting. Off season poultry grazing within. Need another one!

Disease in the High Tunnel?

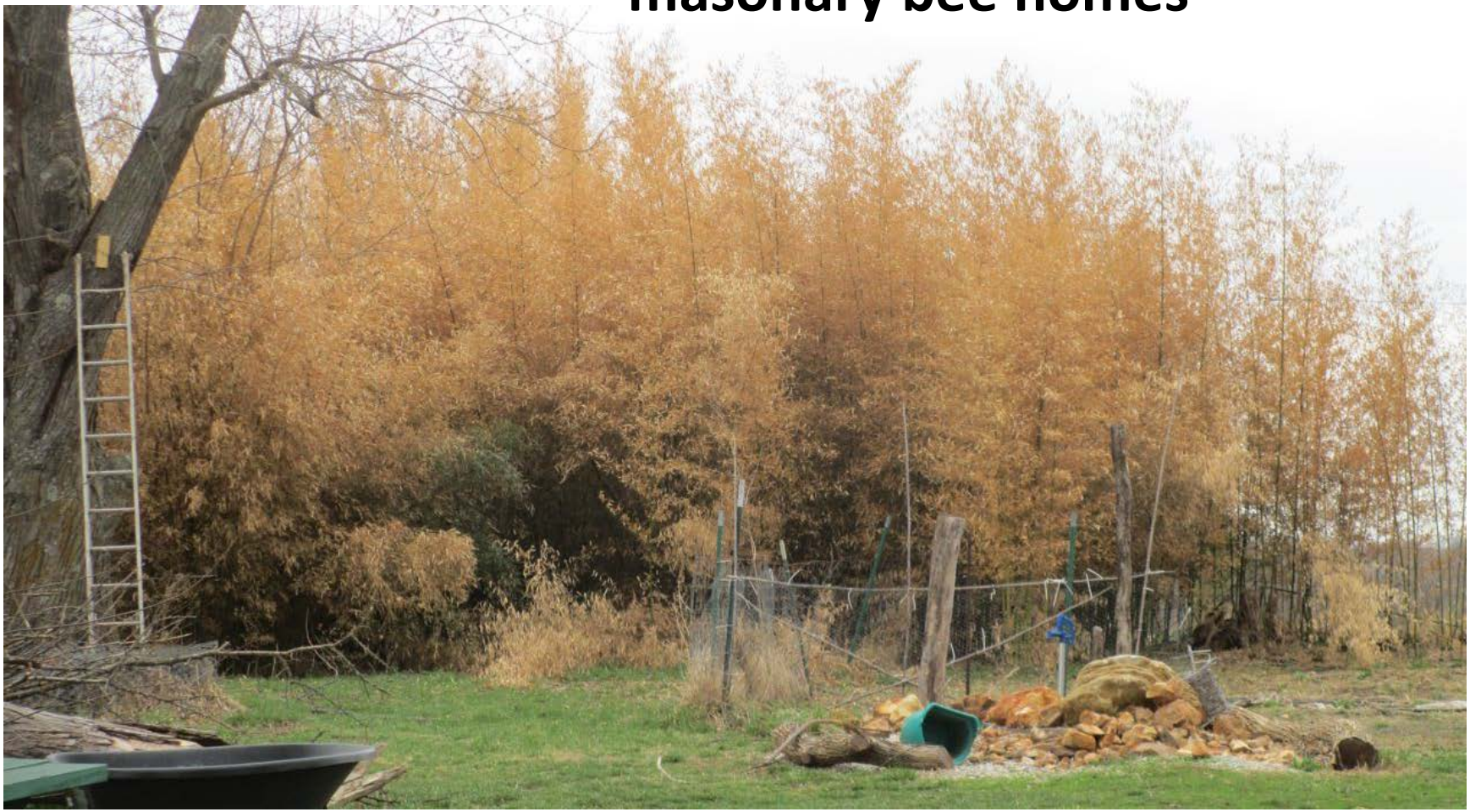
Permaculture

Sun Root- Windscreen/sight screen (9 foot!)

Perennial crop (late Fall harvest); labor/storage

Permaculture

Bamboo- Perennial (7 yr variety); windscreen (20+ft); useable production- stakes and poles; masonary bee homes



2 common and large issues in organic?

Pest Control- organic systems challenges and trade offs

Pest control

Weed Suppression

Insectary Plants- many kinds

Attract "Native pollinators"- many of these are beneficial predators. Structure and food offered. Parasitoid wasps, hover and tachinid flies, others

Insectary Plants- mixed strip/bed

Within growing beds

Cash crop failure- bolts into successful Insectary offerings

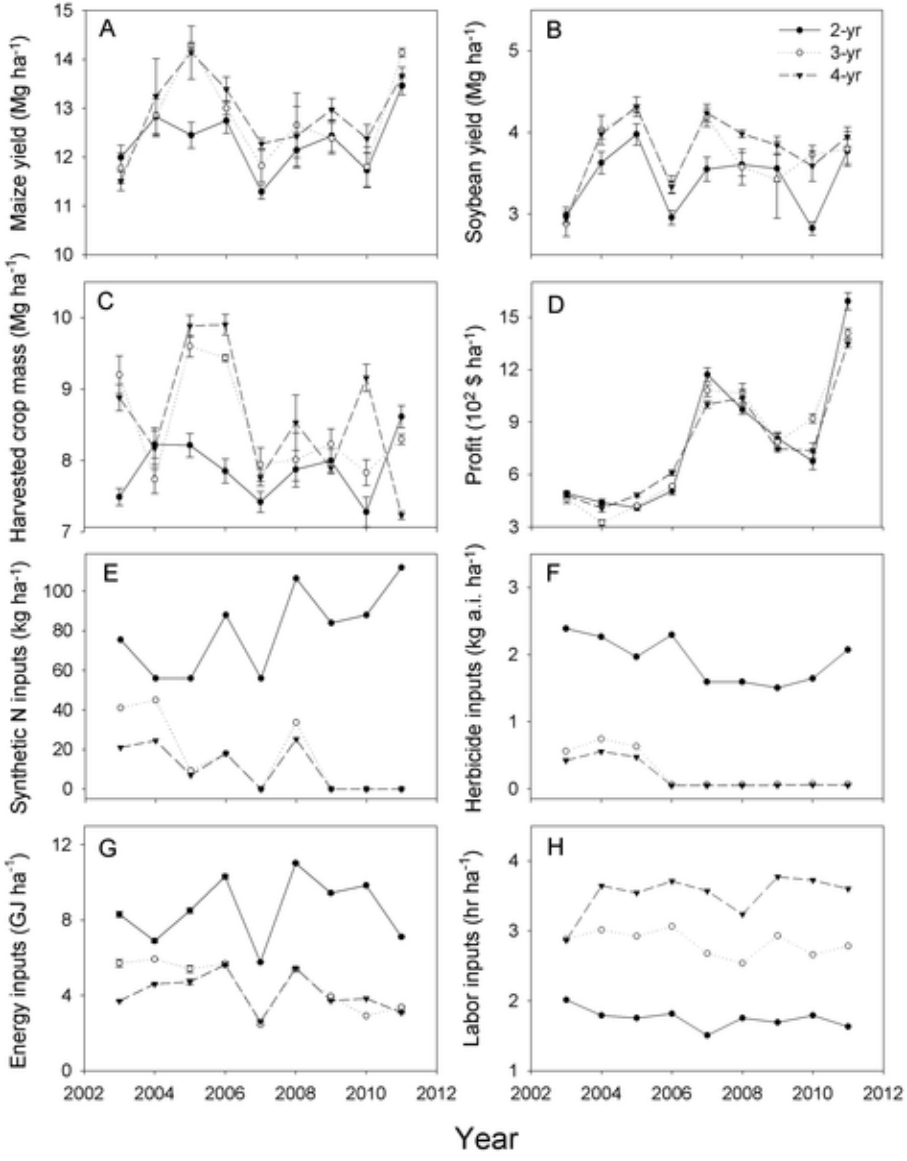
Elderberry- Insectary; cash crop; feed additive; permaculture component

Cover cropping

Mustard, diakon radish mix- Weed suppression- good;
Spaded into bed; compost/manure added;
covered with mulch. Planted Garlic.
Trap Crop- very good! (Harlequins, grasshoppers, etc)

Strip till/spaded beds
Living mulch- interbed work paths

Figure 1. Cropping system performance over time.



Davis AS, Hill JD, Chase CA, Johanns AM, et al. (2012) Increasing Cropping System Diversity Balances Productivity, Profitability and Environmental Health. PLoS ONE 7(10): e47149. doi:10.1371/journal.pone.0047149
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0047149

Cole crops- **Good cash crop. Mulching, drip irrigation, row cover, multiple beds/rotation. Pest damage + Weed pressure- 2 challenges**

<u>Trap cropping</u>- Pest preference;
Kale-harlequin beetles

Many weeds-
horse nettle-potato beetles,
pigweed- blister,
cucumber
beetles

Weeds are trap crops!!
So are cash crops!

Nearby “Bull Nettles” supported potato bugs-
until they “found” the actual potatoes

Trap cropping and Farmscaping

Continue a research program with Dr. Pinero, LU Extension and the Ceres Trust.

1. Compare effectiveness of trap crop plants to manage key Brassica pests. These are the imported cabbage worm, cabbage looper, diamondbacked moth, harlequin beetle).

2. Quantify the effects of insectary plants on the abundance of natural enemies of Brassica pests. These are the parasitoid wasps, assassin bugs, damsel bugs, green lacewings, hover and tachinid flies (others- ground beetles, spiders, etc). Also- note levels of pest suppression- caterpillars and harlequin populations.

3. Pests on the Trap Crops- compare microbial, biological and physical means of suppressing
(read: KILL) the pests on the Trap Crop plants.

4. Assess the effectiveness and associated cost savings of small ruminant grazing as a system to replace traditional tillage and mowing for weed control; Also, does such a grazing system impact insect pest suppression?

Thank you! Questions?