

# Whatley Farm Topsham, Maine

Farming since 2012

Ben, Nick, and Laura Whatley

3 acres Permanent Beds





# Original Equipment

56 HP Kubota tractor with Loader

2 bottom plow and 8' disc harrow

6' Rototiller

Initially opened ground up with Plow/harrow/cover crop/rototiller

Didn't like the number of passes, compaction, destruction of soil structure





# Establishing Permanent Beds

- Chisel Plow, 16" deep
- Form Raised Beds with tractor
- 30" Bed Top, 60" OC
- 2" deep compost on bed tops
- Deep chips in pathways- an immense amount of wood chips



# Initial Results

- OOPS! Initially thought reduced disturbance in bed, compost on bed top and chips in the pathway would earn us more of a pass on weed control
- Crabgrass and perennials (dandelion, thistle, etc.) grew right up through 6" of chips in pathways
- Annuals, winter and summer thrived on bed tops and had to be hand pulled



# **Strategies to reduce tillage**

**Till as shallow as possible to build and preserve soil structure**



# Back to Basics: Reduce weed seed bank!

- Early shallow cultivation could have reduced the need for deep tillage
- Photo shows chickweed that has re-established after 2 attempts to kill with 3" deep pass with BCS Tiller
- Probably would have needed to till 4-6" deep to bury and kill

**We missed the chance to cultivate at thread stage**





# Mulch Delays Reduction of Weed Seed Bank

## Plastic Mulch

- Can help when establishing permanent beds to suppress perennial weeds
- Rodent superhighway!
- Single use plastic!

## Deep Compost

- Expensive and unsustainable
- Danger of overloading nutrients and PFAS

## Wood chipped pathways

- Labor intensive/expensive
- Hard to cultivate
- Rodent Habitat





# Flame Weeding

## Single Pass

Direct Seed right after bed prep  
Flame weed 1-2 days before crop emergence

## Multiple Passes

Wait 4-7 days for weed germination after harvest and bed flip  
Flame weed  
Direct Seed  
Flame Again before crop emergence  
Shallow Cultivate before weeds pass cotyledon stage





# Silage Tarps

Irrigate after harvest

Cover with silage tarp

2-3 weeks to germinate and  
kill weed flush

Remove tarp





# Weed at thread Stage

Scuffle Hoe, Wire weeder,  
Colinear Hoe

Weeds can easily be killed  
with very light cultivation up  
to cotyledon stage

After true leaves weeds must  
be pulled by hand





# Cover Crop to disrupt weed Life cycle

- Oats/Peas
- Multiple Buckwheat Cover Crops in summer can be very suppressive
- Drilled tillage radish –Plant by August 1<sup>st</sup>
- Research by Natalie Lounsbury!

**Plant thick for rapid establishment of canopy**





**Fall Oats/Peas cover  
crop too sparse can  
lead to nursing winter  
annuals like  
chickweed.**





# Dense Canopy Crops

Carrot, Parsnip and Celeriac can result in suppression of chickweed and other fall annuals

- Flame weed before emergence
- Wire weed
- Hand weed as necessary until canopy closes





# Carrot Bed After Harvest

Complete disruption of fall annual weeds

Pulling Root Crops brings new weed seed to surface





# **Tools We Use To Reduce Tillage**



# Wire Weeder

- Good for thread stage
- Fast Tool Change – Quick Connect
- Multiple sizes on a standard tool handle





# 11" Wheel Weeder

- Basket Weeder Disturbs top 1"
- Blade in back cuts through roots





# BCS 853

- Secret Weapon – Adjustable axle extensions
- Keeps wheels off bed top and tractor out of field





# 30" Flail Mower

Chops crop residue and leaves on the surface

Set as low as possible

Doesn't consistently cut through crowns of mature brassicas





# Power Harrow

Stirs top layer of soil only with no inversion - Leaves deeper layers intact and uncompacted

1-1/2" deep incorporates 1" compost and amendments for Jang Seeder

2" deep works well for paperpot transplanter

**Will not terminate weeds with established crowns**





# Tilther

15" original Eliot Coleman  
Design

Rototill 1" deep

Good preparation for direct  
seed

Can be helpful weed killer if  
weeds are still very small





# BCS Rototiller with Precision Depth Roller

Able to dial in precise depth with  
attached roller

Depth Roller firms seedbed and  
ensure tiller cannot get deep where  
it does the most damage

Basically a 30" tilther

Good tool if you don't want to buy a  
power harrow

