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

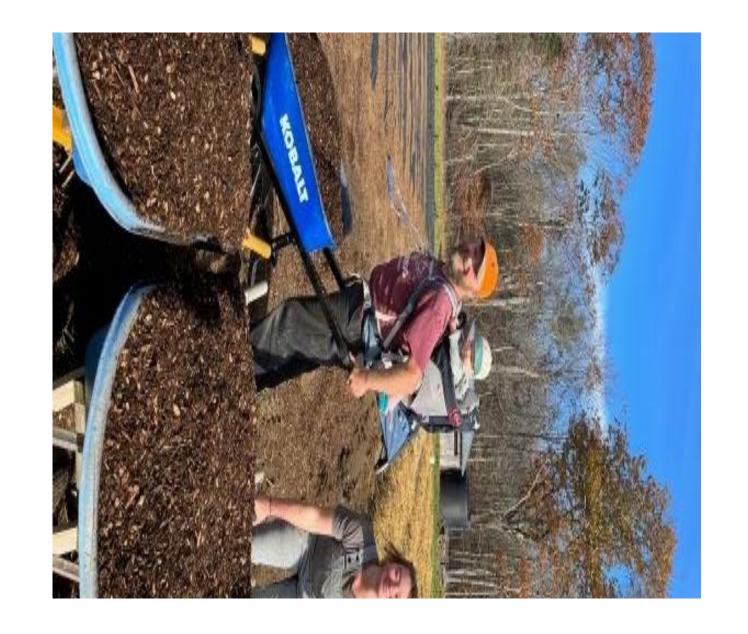
Initially opened ground up with Plow/harrow/cover crop/rototiller

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

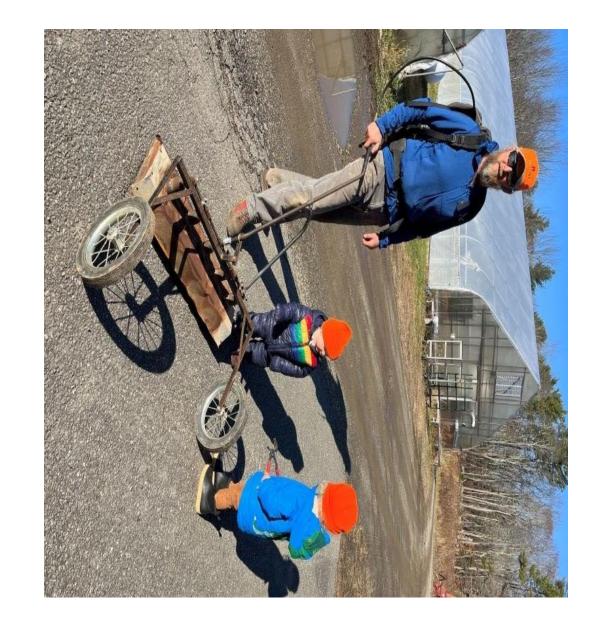
Wait 4-7 days for weed germination after harvest and bed flip

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 1st
- Research by Natalie Lounsbury!

Plant thick for rapid establishment of canopy



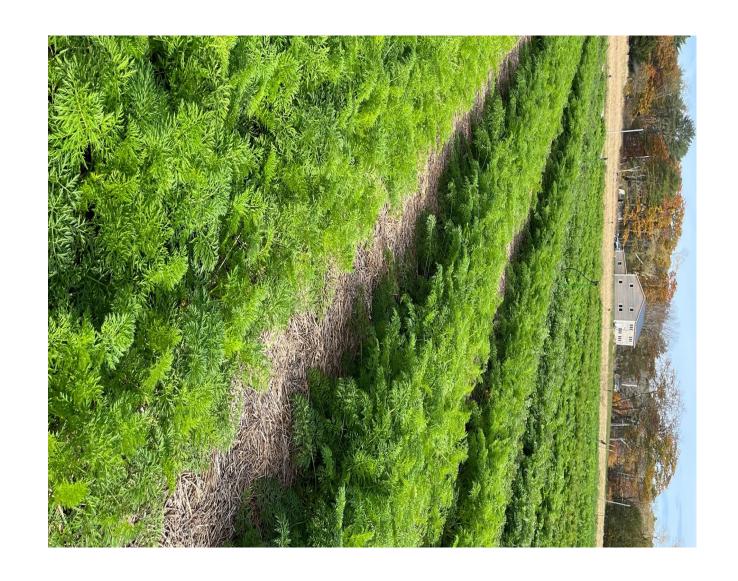
Fall Oats/Peas cover crop too sparse can lead to nursing winter annuals like chickweed.



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

