



Innovations for Organic Vegetable and Berry Farms



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UNIVERSITY OF
VERMONT

EXTENSION

Farm practices, applied research on:

- Reduced tillage, tarps
- Between-row soil covers
- Cover crops
- Mechanical weed control
- Tunnels
- Insects
- farmOS

Tarpping plus minimum tillage for leafy greens



The New Farm, Creemore Ontario

Normal practice is to rototill the crop residue into beds after harvest



Instead, applied 6-mil, 40' x 200' silage tarp for 2 weeks



Sealed the tarp edges with soil, by hand



Left in place for 2 weeks, at 5 different times in season





Lettuce stubble after 2 weeks under tarp

**Bed prep after tarp removal = minimum till
with tine weeder, instead of rototiller**



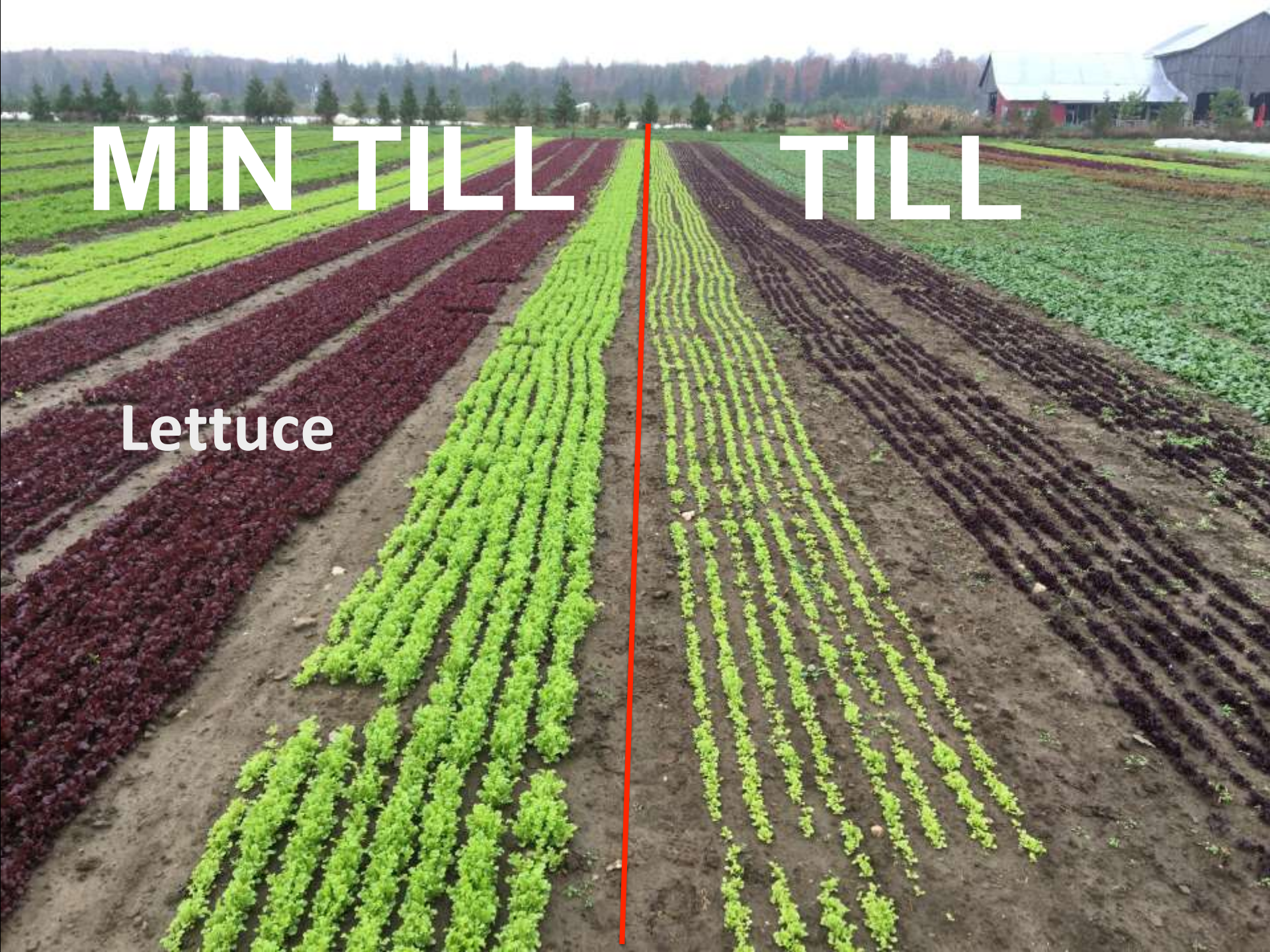
Then, direct seeded lettuce, spinach, or mustard



MIN TILL

TILL

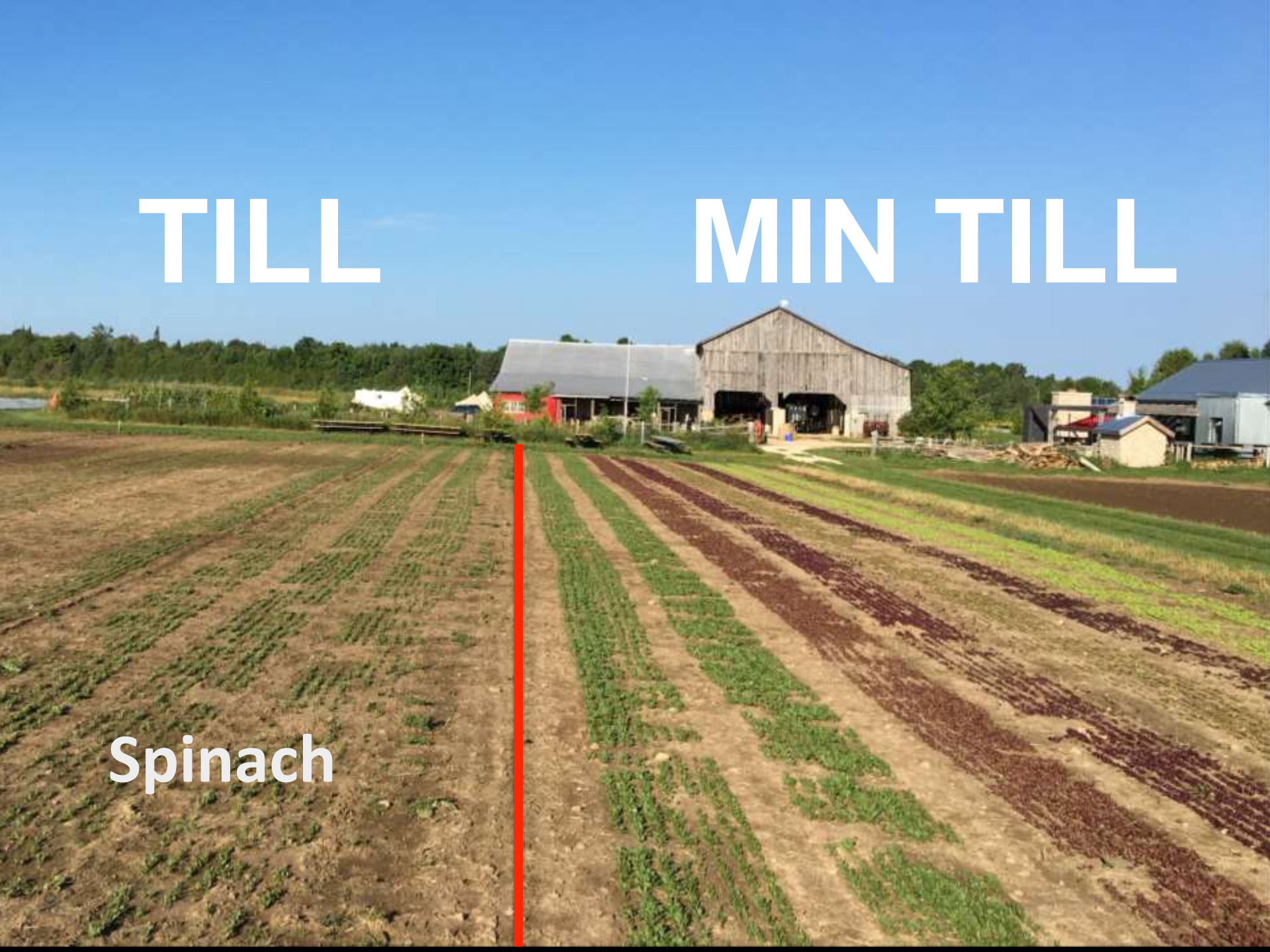
Lettuce



TILL

MIN TILL

Spinach



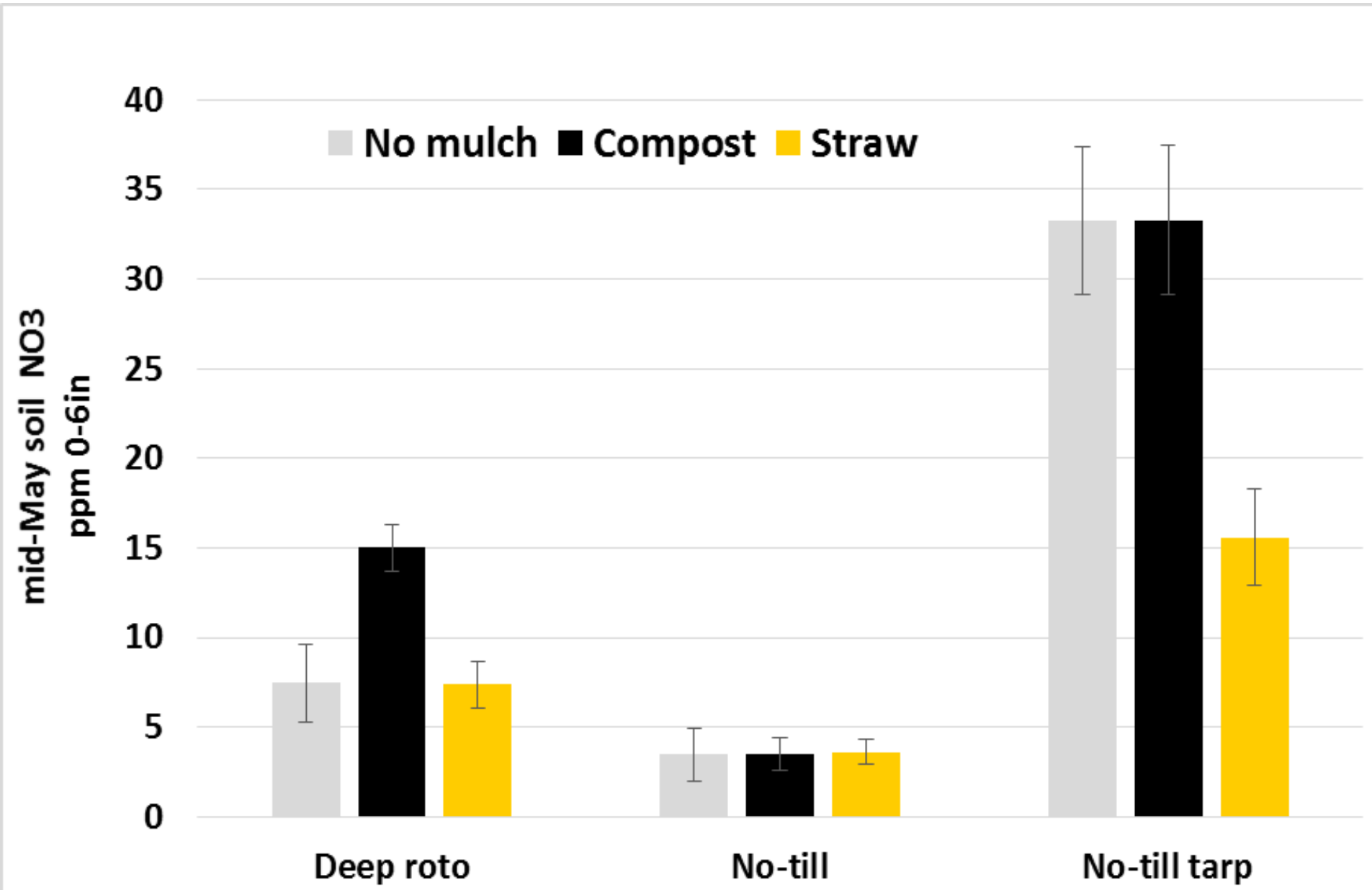
MIN TILL

TILL

Mustard



Plant available soil N increased under tarps across several soil treatments: Brian Caldwell, Cornell research



Crimped and solarized winter rye 'no-till'



Cedar Circle Farm, E. Thetford



Plant winter rye thickly, knock down late spring, use old greenhouse plastic to solarize weeds that break through.

Make a slit in the killed rye for transplants



Supplement with straw if needed



August 21

Slit-till into early-summer killed rye, for transplants



Hudak Farm, Swanton

August 4

Knock down maturing rye with cultipacker, make strip for squash transplants with Yeoman's plow







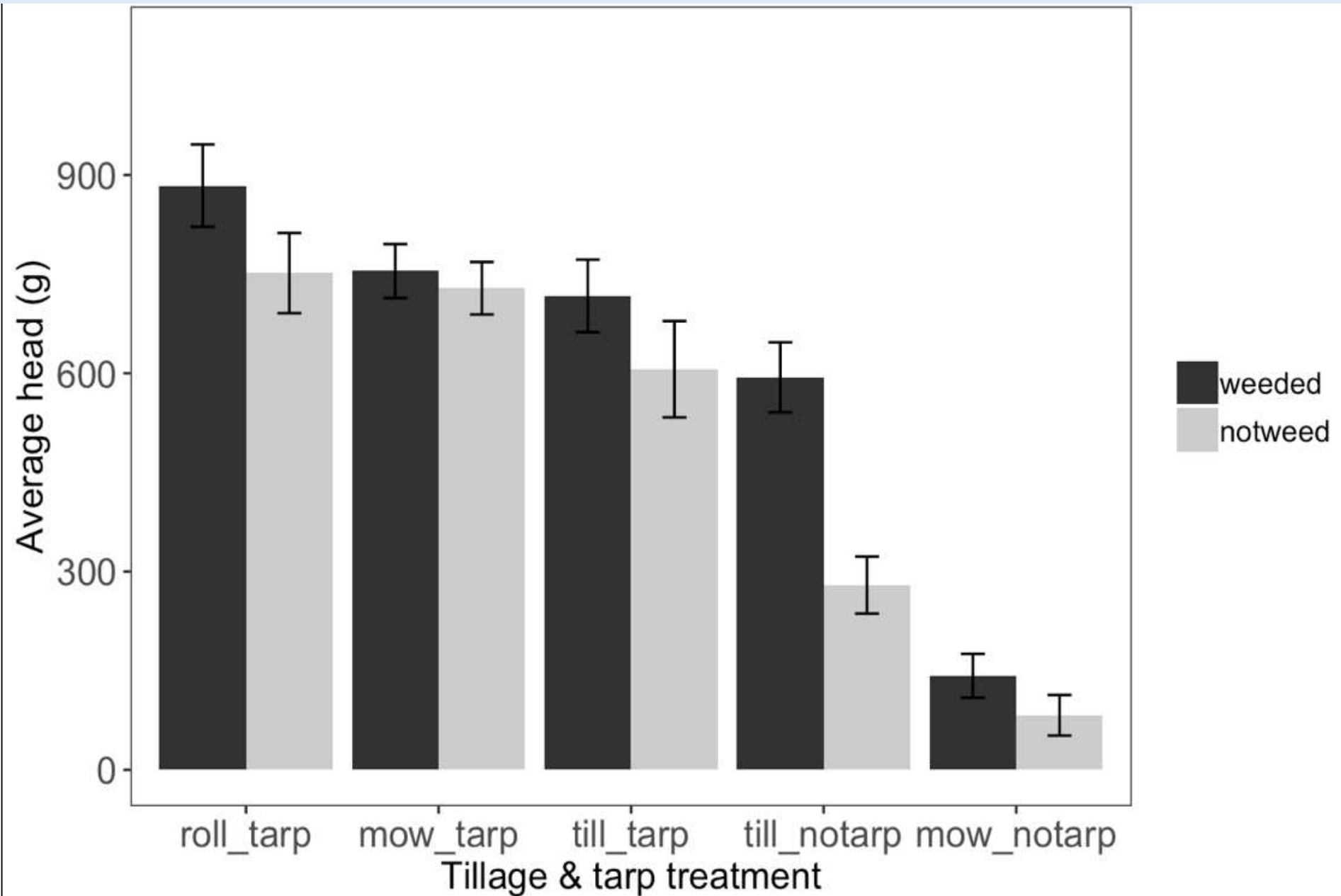
April 25, after 2 years of no till

Natalie Lounsbury, UNH research: tarping after a rye and vetch cover crop for transplanted cabbage

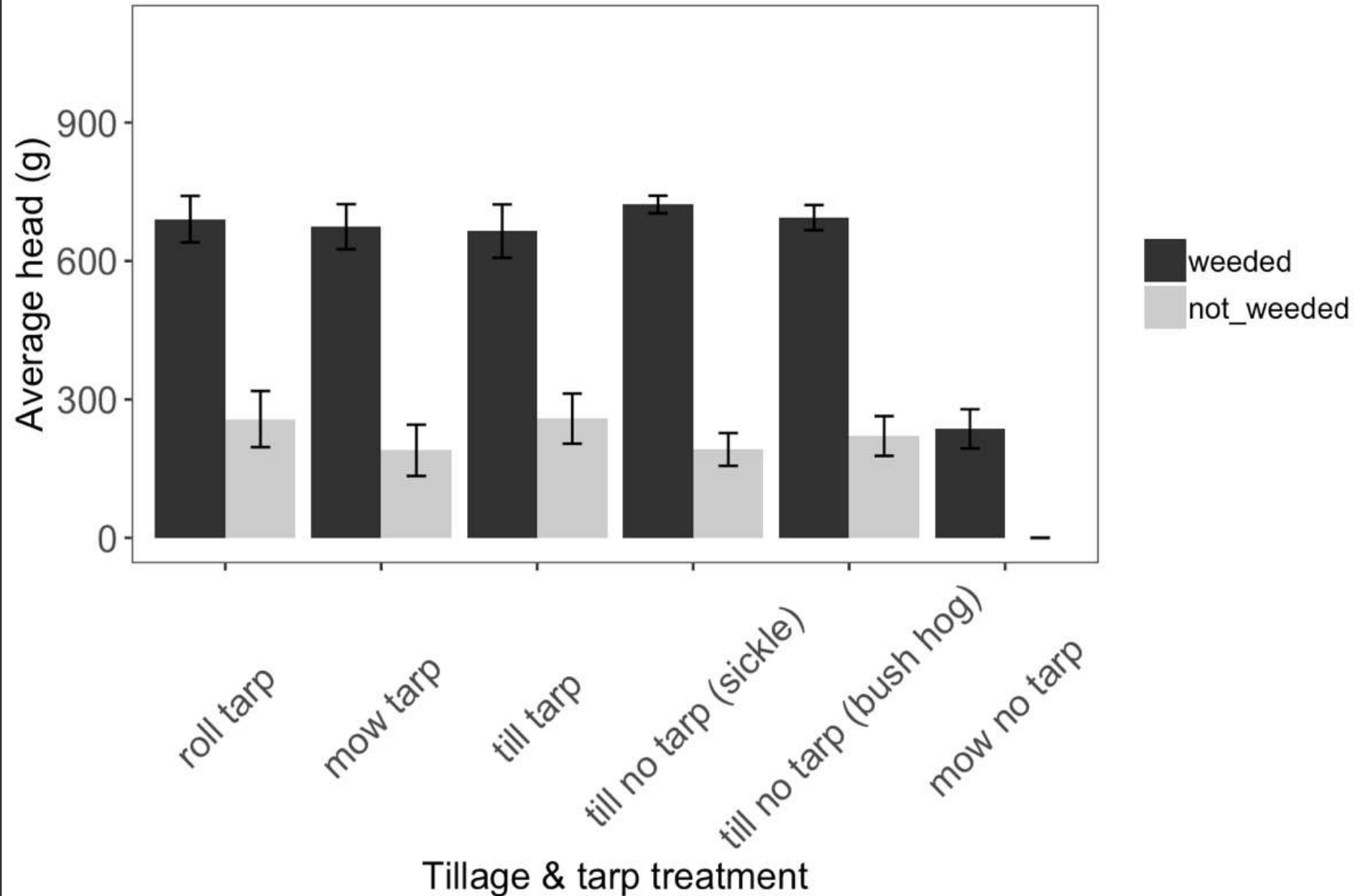


High biomass cover & good soil moisture at tarping are needed for weed suppression and crop growth

Treatments early June 2017, cabbage transplanted early July



2018: lower cover crop biomass, drier soil, more weeds



Sonja Birthsiel, UMaine research: 2 weeks of solarization with clear 6-mil poly in May/June kills many weeds for a 'stale seedbed'



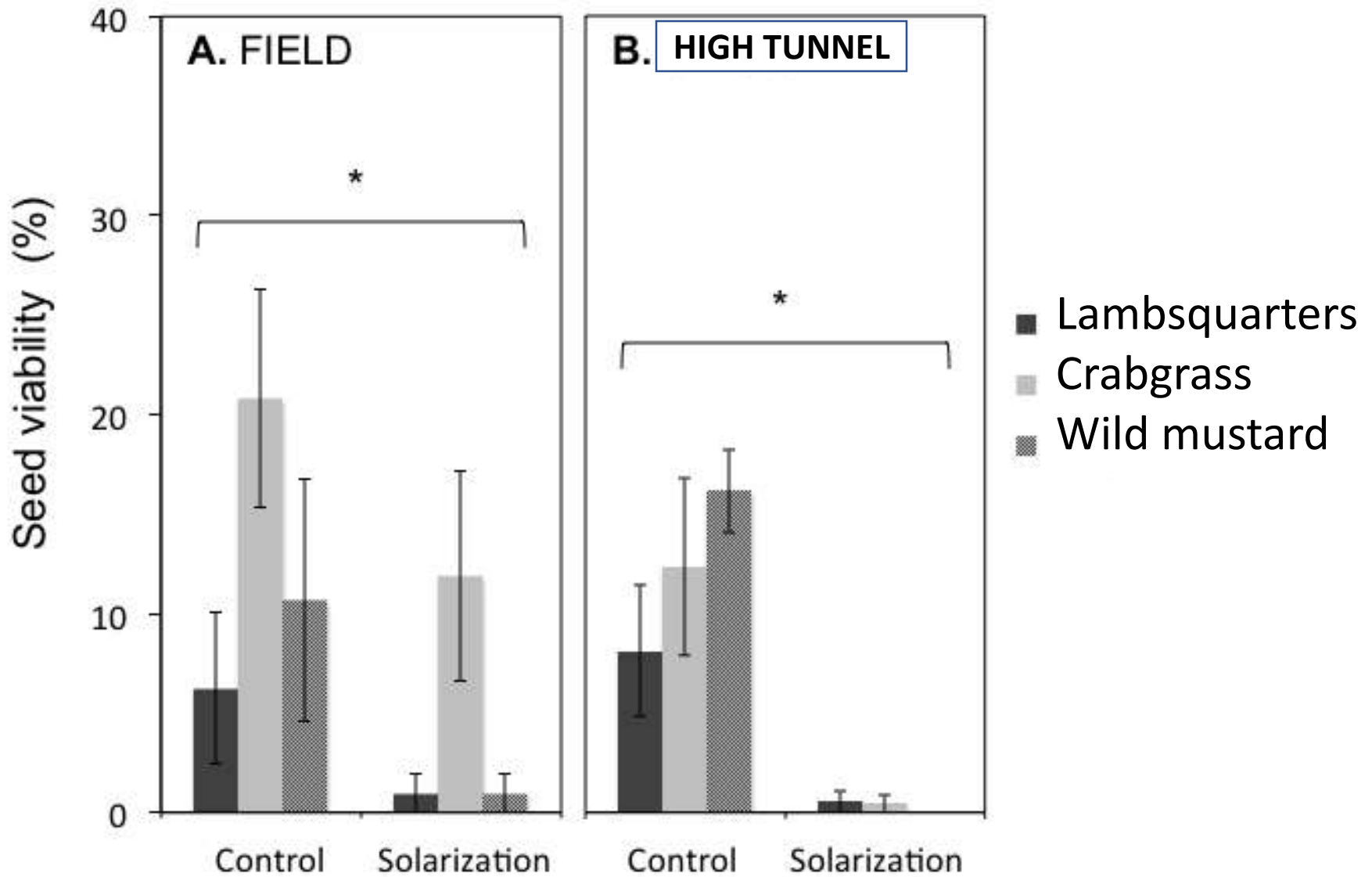
<https://umaine.edu/weedecology/2017/04/10/solarization-to-prepare-a-stale-seedbed/>



Soil temperature at 2 inch depth during 2 weeks of solarization

| | Max avg. temp (°F) | Exposure time (h) | | |
|--------------|-----------------------|-------------------|-----------|---------|
| | | 98-104°F | 105-113°F | > 113°F |
| control | 90 | < 1 | 0 | 0 |
| solarization | 108 | 20 | 13 | < 1 |

Weed seeds in buried bags after 4 weeks of solarization



Tips for success with solarization

Soil should be moist – rain or irrigation

Edges must be sealed tightly: soil or pipes, not rocks

Add amendments ahead of time

Limit disturbance after removal – brings up seeds

Purslane and perennials not well controlled

Weed mat between plastic beds, with staples



Basin Farm, Bellows Falls

Weed mat between plastic bed, with sand bags



High Meadows Farm, Putney

Weed mat should overlap plastic on beds



Green Wagon Farm, Keene

Landscape fabric between plastic beds in mid-July



Blais Farm, Springfield

landscape fabric on blueberries



Annual ryegrass walkways between plastic beds



Clearbrook Farm, Shaftsbury

Inter-seeded oats with strawberries



**Lilac Ridge Farm,
W. Brattleboro**

Oats between plastic beds



Mighty Food Farm, Shaftsbury

Cutting winter rye onto fall-laid plastic



Elderberry Pond Farm , Auburn NY

Annual ryegrass strips between bare beds



**Foote Brook Farm,
Johnson**

Seeding annual ryegrass strips, early June



August-planted tillage radish on Oct. 10



**Northeastern Vine Supply
West Pawlett**

cover cropping in high tunnels



may encourage insect pests??

Mustard as a bio-fumigant

A wide-angle photograph of a lush green field of flowering mustard plants. The plants are densely packed and in full bloom, with bright yellow flowers visible against the green foliage. In the background, there is a dark line of trees and a structure covered in blue plastic sheeting, possibly a greenhouse or a covered walkway. The sky is overcast with grey clouds.

Four Corners Farm, S. Newbury

Tips for success with biofumigation

Incorporate mustard before full bloom, when soil is moist.

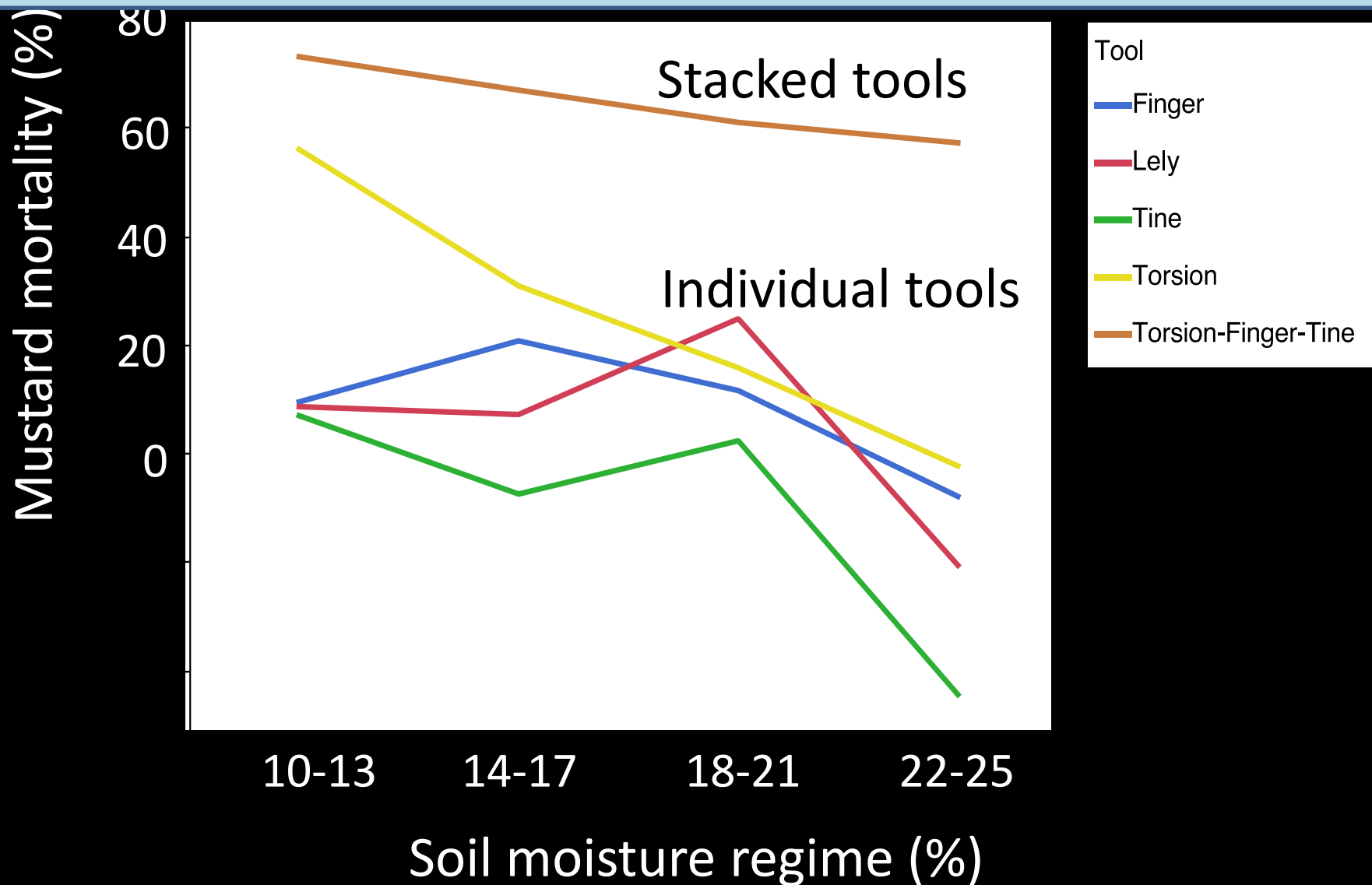
Before incorporating, chop/crush as much as possible, i.e. flail mow

Incorporate IMMEDIATELY, 80% of fumigant gas is released in 20 min.

Keep plant material in the top 6 to 8 inches; do not use a plow.

Roll and pack soil to trap fumigant gas, or cover with tarp.

“Stacking” tools to improve mechanical weed control





tine

finger

torsion

(slightly) raised beds in tunnels



Unity Farm, Charlotte

drop-down sides for winter growing

A long, narrow greenhouse with a metal frame and white plastic covering. The sides are partially dropped down, revealing rows of green leafy plants growing in the ground. A black irrigation pipe runs along the rows. A yellow marker is visible in the middle of the rows.

Sunrise Farm, White River Junction

A great resource for growers

Plant Mediated IPM Systems :

Indicator plants

- pull pests away from crops, for monitoring

Trap plants

- pull pests away from crops, for control

Banker plants

- supply 'non-pest' prey to feed biocontrols

Habitat plants

- provide food and shelter for biocontrols



Thrips indicator

Traps spider mites

Habitat for natural enemies

Raising aphid biocontrols on “banker plants”



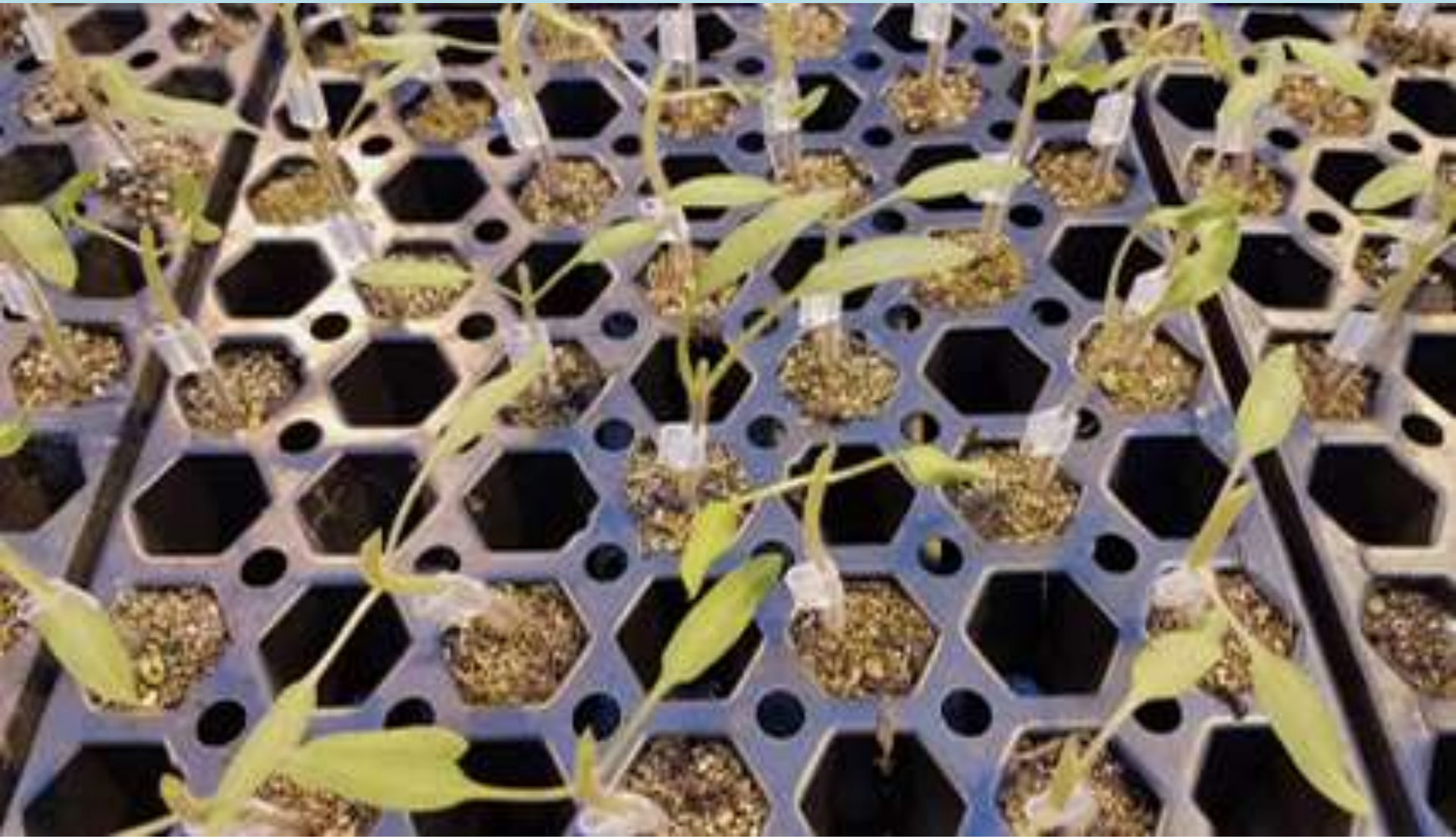
Old Athens Farm, Putney

Cutting top off of grafted tomatoes to create two leaders instead of one



Longwind Farm, E. Thetford

after topping



grafting the “discarded” top





healing conditions are key





Chick weed can be a big problem in winter tunnels



Steaming tunnel soil for weed control



Heron Pond Farm, S. Hampton NH



Trusscore corrugated PVC for easy to clean, bright wall surfaces



<http://blog.uvm.edu/cwcallah/2016/04/29/finish-surfaces-for-produce-and-food-areas/>

Light colored wash tubs let you see product and water quality better



**Many pack shed tips, videos at UVM Ag Engineering blog
<http://blog.uvm.edu/cwcallah/>**

insect screening on tunnel for cucumber beetle





screen all openings, increase ventilation

Laser systems for bird control



Sunshine Berry Farm, Rochester

Scentry traps for monitoring SWD



Rich Krzal, Thetford

Shelburne Farms Market Garden



- **Variety: Chandler**
- **Potted tips in 50-cell trays Aug. 6**
- **Under shade cloth and misters**
- **Transplant in tunnel Sept. 10**
- **Cover with 1 layer Ag 19 when <40F**
- **Add Typar cover mid-November**
- **First big harvest May 25**
- **3 markets before any other strawberries**

farmOS for recordkeeping and planning

- Stores soil tests, fertilizer plans, and records
- Maps your fields
- Records plantings, harvests, much more...



VVBGA farmOS

Nutrient management planning with farmOS

Free for VVBGA members!

Nutrient Management Dashboard

- 🏠 Dashboard
- Nutrient Management
- Produce Safety
- Quick forms

Nutrient management

This dashboard provides shortcuts for keeping nutrient management records with farmOS. More information can be found in the [Nutrient Management module documentation on farmOS.org](#).

VVBGA Resources



This nutrient management dashboard was sponsored by the [Vermont Vegetable and Berry Grower's Association](#), in collaboration with [farmOS](#). For more information, visit <https://farmos.vbga.org/>.

The goal is to guide growers through the process of organizing planning and management records for compliance with [Vermont's Required Agricultural Practices](#) around nutrient management.

Use the links in each of the three sections to the right to add soil tests, manage your nutrient management plans, and record soil amendments.

If you have questions, or would like someone to review your nutrient management plans and records, contact Becky Maden at rebecca.maden@uvm.edu or 802.773.3349x277

- ▾ Soil tests
- ▾ Nutrient management plans
- ▾ Amendment records

farmOS –getting going

- **Register** – *free for VVBGA members*
- **Create your farm's unique URL**
 - *Ex: beckstestfarm.vvbga.org/*
- **Use quick links to complete three simple steps**
 - *Upload soil tests*
 - *Upload plans*
 - *Record amendments*



thank you!