Cornell AgriTech

New York State Agricultural Experiment Station

Cover crop considerations prior to and following root crops

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Cover crops on the vegetable farm

Cornell AgriTech Vegetable Research Farm, Geneva NY. November 2021

Common management goals for root crops

- Competition against weeds
- Friable soil
  - Soil aggregation
  - Decomposed plant residue
- Suppress soilborne disease
- Nitrogen scavenging

Best locally adapted cover crops for New England

- Medium Red Clover
- Hairy Vetch
- Rye & Triticale
- Oats
- Forage brassica
  - Turnip
  - Rapeseed
  - Radish
- Buckwheat
- Sudangrass

Weed suppression

- Buckwheat for summer weeds
- Forage crucifers for fall weeds
- Rye or triticale for winter weeds

Buckwheat for summer weed control

Buckwheat

Forage radish for fall weed control

Triticale for winter weed control

Common management goals for root crops

- Competition against weeds
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Friable soil

- Buckwheat in late summer
- Millet in mid summer through early fall.
- Live roots a lot of the time
- Fine roots
- Not a lot of lignified biomass, but a lot of biomass
- Minimize tillage

Crumb in soil

Hard to harvest

Easy to harvest

Root systems vary

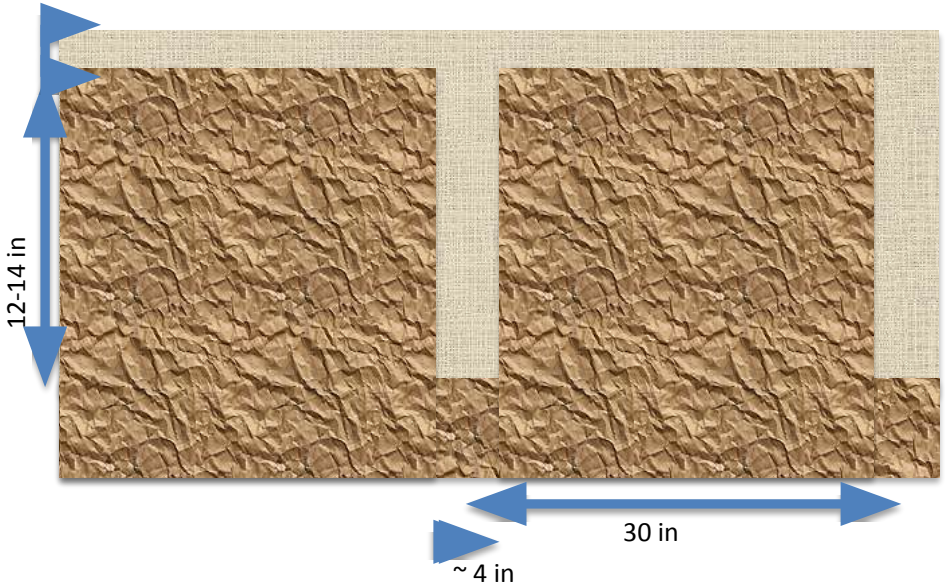
Terminating early for small seeds

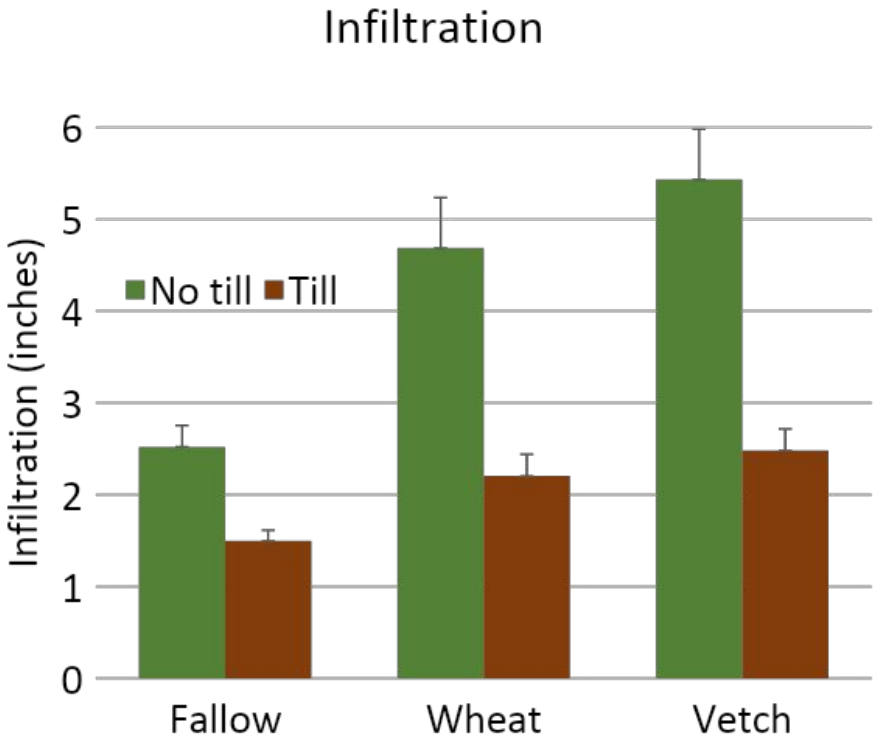
Terminating early for small seeds

Triticale terminated early has a lot of roots

Reduce tillage to get cover crop benefit

Localize tillage





A. Nouri et al. Geoderma
After 34 years of tillage and winter-cover treatments

Common management goals for root crops

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Suppress disease

Soil physical health

- Stable aggregates
- Compaction
- Percolation
- Soil Protein
- Active carbon


High-glucosinolate brown mustard
Pacific Gold, Caliente

Dying mustard roots release toxic gas next to pathogens in soil

Sudangrass

Some varieties suppress some nematodes

Common management goals for root crops

- Competition against weeds
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- Suppress soilborne disease
- Nitrogen scavenging

Scavenge nitrogen

- Live roots as deep as possible
- Lot of green leaves or storage organs
- Hold nitrogen until spring

Tillage Radish

Winterkilled early and lost nitrogen

Forage Rapeseed


Rye
High N availability
Low N availability

Hairy vetch

Selection tools

- Northeast covercrop.tools
- Field crops and selected vegetables
  - Region-specific production information
  - Many goals
  - Linked to production information
  - Large expert panel (Northeast CCC)
  - Modular tools for farm-specific guidance

covercrop.tools

Cover Crop Explorer

covercrop.tools

30%

Search

NORTHEAST COVER CROPS COUNCIL

Cover Crop Decision Support Tools

February 23, 2022

COVER CROP EXPLORER | SPECIES SELECTOR TOOL

FILTER

PLANT HARDINESS ZONE

Zone 4 | Zone 5 | Zone 6 | Zone 7

Cover Crop Name

Search by cover crop name

CLEAR FILTERS

COVER CROP TYPE

ENVIRONMENTAL TOLERANCES

SEEDS

SEEDING METHODS

GROWTH

Duration

Annual | Biennial

BRASSICA

Brassica, Forage

Brassica oleracea

View Crop Details

ADD TO LIST

GRASS

Cereal Rye, Spring

Secale cereale

View Crop Details

ADD TO LIST

GRASS

Cereal Rye, Winter

Secale cereale

View Crop Details

ADD TO LIST

BRASSICA

Mustard

Brassica juncea

View Crop Details

ADD TO LIST

GRASS

Oats

Avena sativa

View Crop Details

ADD TO LIST

GRASS

Oats, Black

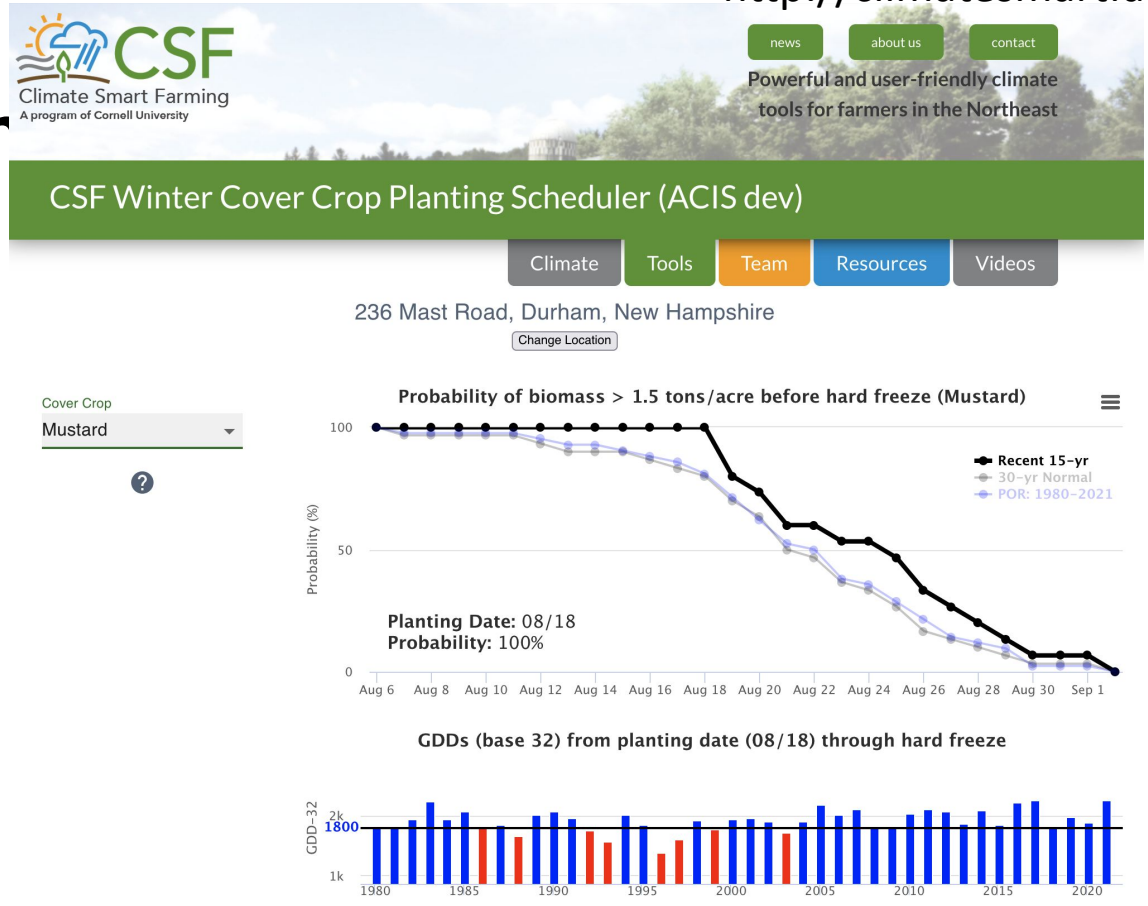
Avena strigosa

View Crop Details

ADD TO LIST

Predicting nitrogen scavengir

http://climatesmartfarming.org/tools/



Keys to success

1. Fast start
2. No gaps
3. Kill on time

Things to remember

- Know what you are trying to achieve
- Pick the cover crop best suited to your goal(s)
- Fast start. No gaps. Kill on time.

Tools

- Covercrop.org

  For NY vegetable growers
- Covercrops.tools

  From Northeast cover crop council
- climatesmartfarming.org

  Planting date customizing