UMassAmherst

Troubleshooting Corn after Cover Crops

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March 6, 2017

Outline

1. CC Yield at Research Farm and On-Farm

2. Reduced Tillage – Disking Only
   - Field prep, herbicide, fertilizer

3. Reduced Tillage – No Till Corn
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4. Digestive System of the Field

5. Corn Yield: The Ugly Duckling

6. Corn Yield: The Swan

7. Take Home Points

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Dual-Purpose Cover Crop Yields

- UMass Research Farm:
  0.7 – 1.5 tons Dry Matter
  - Planted between Sept 1 – Sept 30 after manure application
  - Rye, Wheat, and Triticale (forage varieties)
  - 0-50 Lbs. N-application in spring

May 3, 2017 – Wheeler Rye
Me for scale (standing); Rye about 3’

Dual-Purpose Cover Crop Yields – On Farm

- Local dairy farm. Planted 9/28 after manure no additional N; 1.25 Acre strips.

Dual-Purpose Cover Crop Yields – On Farm

Crop	Yield Per Acre (Tons of Dry Matter)	Relative Feed Value	Milk Value (lbs/A)	Milk Value (lbs/ton of dry matter)
Rye (Wheeler)	1.5	100	4100	1300
Wheat (Emerson)	1.4	116	3900	1370
Triticale (Organic, VNS)	1.2	111	3700	1500
Triticale (Trical 815)	1.75	104	4800	1400
Triticale (NE426GT)	1.5	106	3900	1400

- Local dairy farm. Planted 9/28 after manure no additional N; 1.25 Acre strips.
- Harvested on May 16

Dual-Purpose Cover Crop Yields – On Farm

- 2nd Local Dairy Farm: Planted 9/20; mixed TriCal® 815 and 135; 45 Acres
  - + 30 lbs. N in spring
  - **1.8 tons DM/Acre**
    - **Harvested on May 9**
    - Relative feed value -(based on fiber) = 91.5
    - Relative feed quality -(based on protein and fiber) = 110, good
    - Milk (lbs) per ton of feed = 2615
      - Vs 1300-1500
    - Milk (lbs) per acre of feed = 9410
      - Vs 3700-4800
    - CP = 17

Contact Sam for RFV testing

From This ⟶ To This

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Reduced Tillage - Disk Only

2016

- Disked 5/7
- Disked 5/15
- Pre (Magnum, active ingredient S-metolachlor) and post (glyphosate) emergent herbicide applied between first and second disk and broadcast N at rate of 40lbs A-1

- Planted 5/16
- 40 lbs. at sidedress

- Worked beautifully for planting

Reduced Tillage - Disk Only

2017

- Disked 5/23
- Disked 5/24
- Planted 5/25
- Pre and post herbicide 5/28
- No start up fertilizer
- 160-180 lbs N recommend from PSNT
  - Applied 80-90

Did not work beautifully

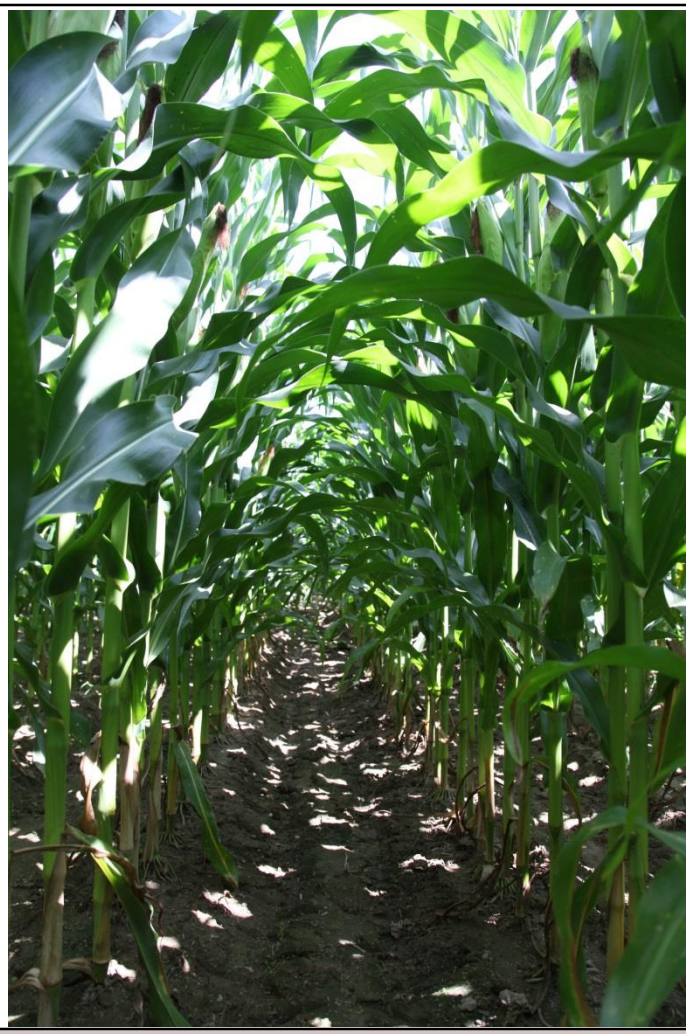
Reduced Tillage - Disk Only

Reduced Tillage - Disk Only

Reduced Tillage - Disk Only

In a nutshell:

1. 5-7 days between 1st and 2nd disk
   - Integrate with manure application schedule
   - Poor planting/spacing = decreased yield
2. Start up fertilizer (preferably manure)
3. Pre and post herbicide
4. PSNT



August 24, 2017
Still Weed Free

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Reduced Tillage – No Till

2016

- Harvested 5/4/16
- No-till corn planted on 5/12
- Banded N at rate of 40lbs A^{-1}
- Herbicide 6/3 (glyphosate only)
- Sidedress rate of 40lbs A^{-1}

Did not work well.

Reduced Tillage – No Till

2017

- Harvested May 11
- Pre (Magnum) and post (roundup) herbicide
- No-till corn planted on 5/16
- Banded N at rate of 40lbs A^{-1}
- Sidedress rate of 80 lbs A^{-1}

- PERFECT.


July 11, 2017

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August 24

Reduced Tillage – No Till Corn

In a nutshell:

1. Spray down before or right after planting
   - Pre and post herbicide
2. Start up fertilizer
   - (preferably manure) or band N
3. PSNT

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Consider the Field History

https://www.foodqualitynews.com/Article/2017/04/03/Mars-Fera-R-Biopharm-AOAC-at-food-fraud-event

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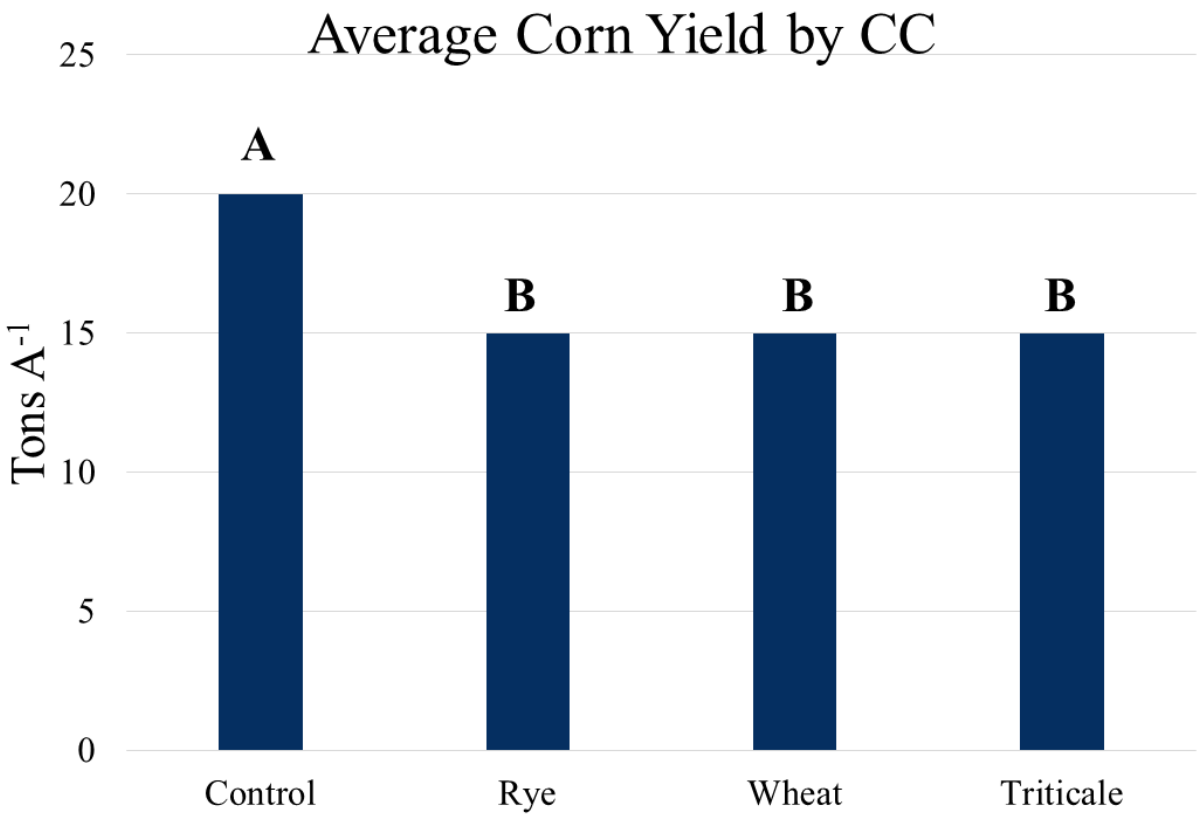
Ugly Duckling

- 2015 With NO sidedress N applied: 18-26 tons silage (65% moisture)
- 2016: 1 Inch of rain the whole summer.
- 25% corn yield suppression after CC
- Drought can make a perfect storm



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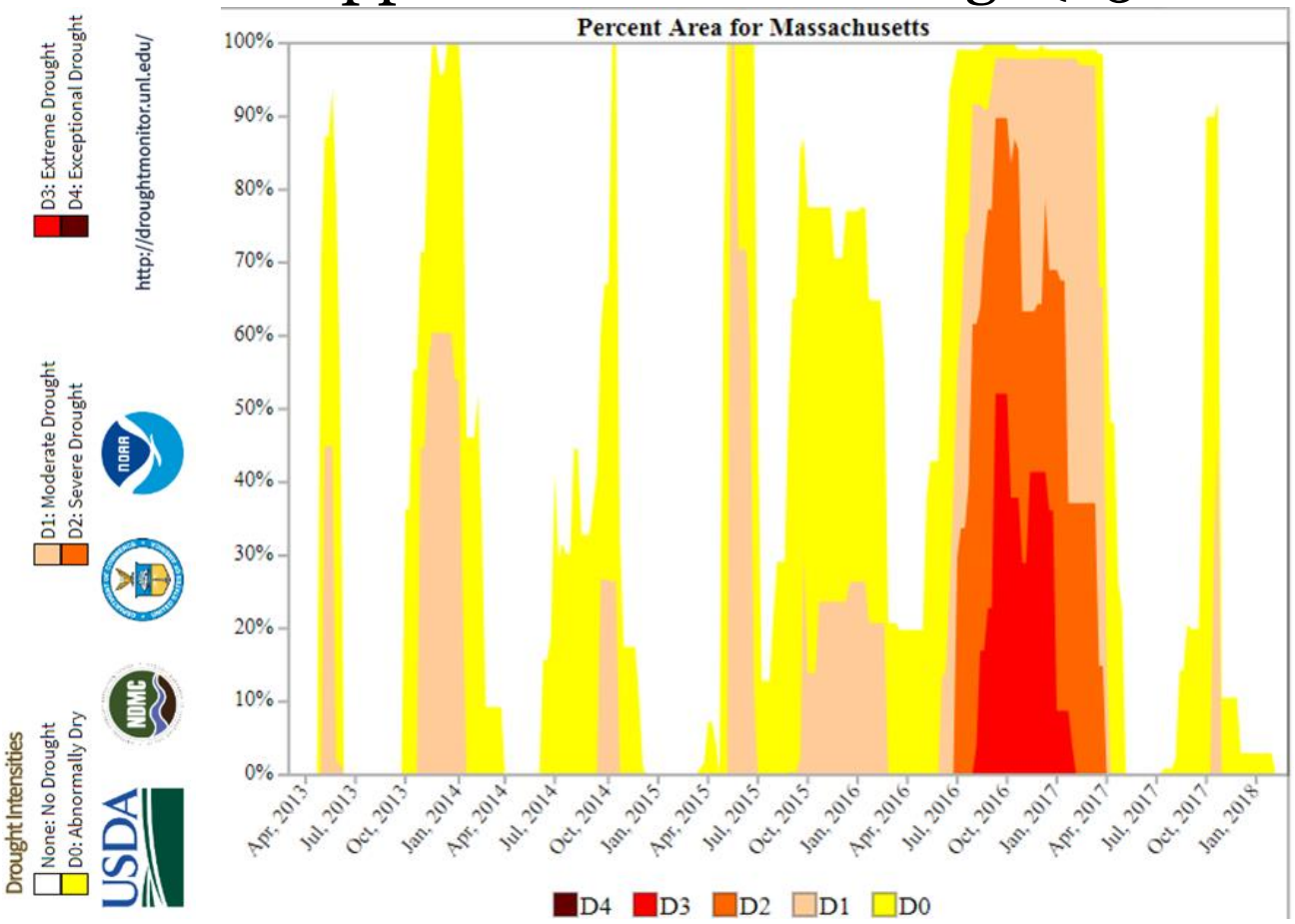

https://www.drought.gov/drought/states/massachusetts

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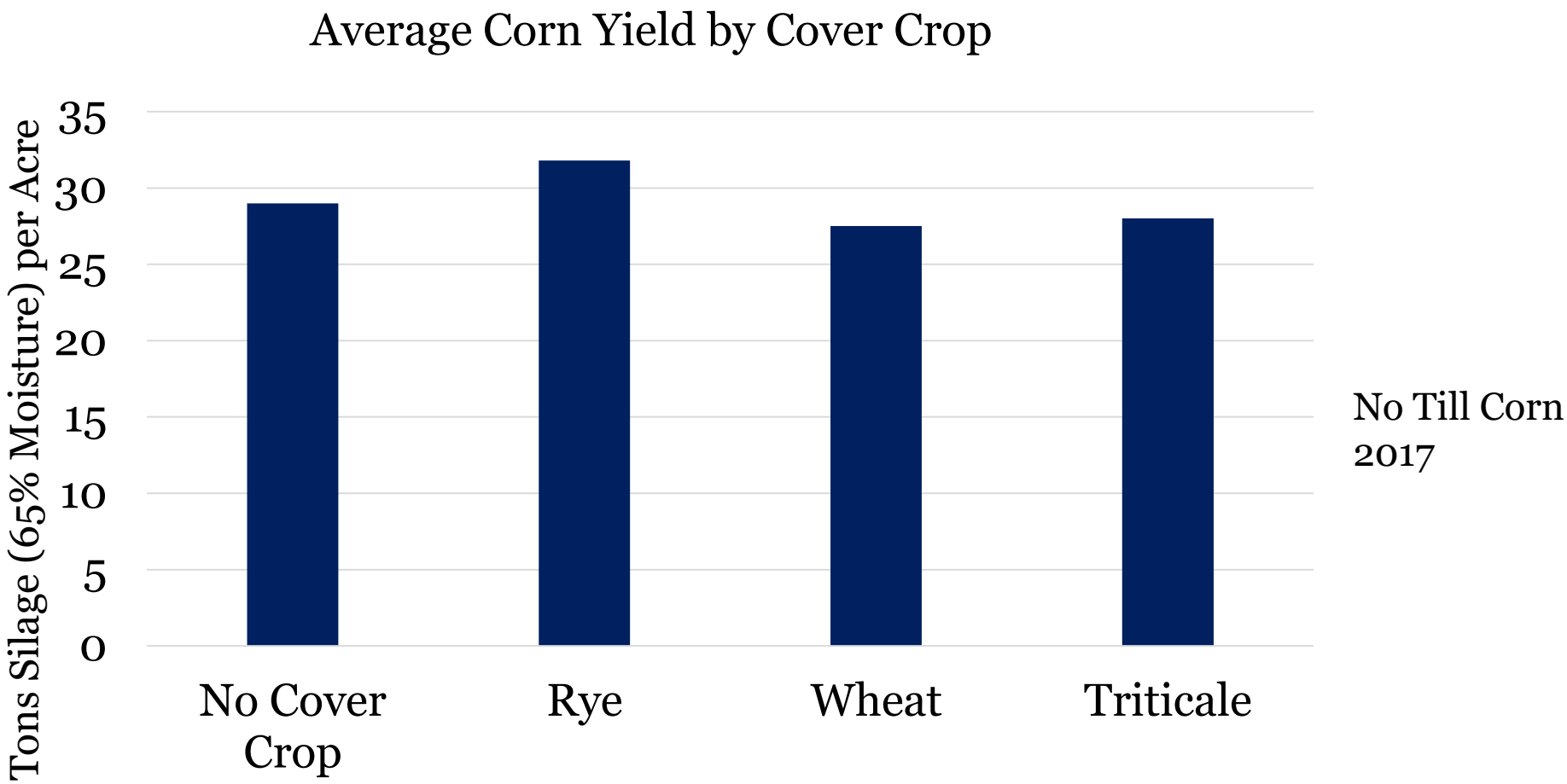
Swan


Average Corn Yield by Cover Crop
Tons Silage (65% Moisture) per Acre
35
30
25
20
15
10
5
0
No Cover Crop
Rye
Wheat
Triticale
No Till Corn 2017

Swan

Disked Experiment:
Short (87 Day) – 22 Tons
Mid (92) – 26 Tons
Full (107) – 28 Tons

Averaged across maturities:
Corn grown after cover crops planted on 9/1 and 9/15 yielded 1 ton more than corn planted to plots with no CC or CC planted on 9/30

Average Corn Yields (UMass Hybrid Trials)

Average Silage Yields (Tons A^{-1})				
Year	Shorter Season (≤ 98 days)		Longer Season (>98 days)	
	Yield	Varieties Tested (#)	Yield	Varieties Tested (#)
2002	26.0	10	26.6	19
2003	30.4	18	29.4	7
2004	21.8	11	22.8	14
2005	29.1	6	27.9	12
2006	30.0	7	32.0	13
2007	29.6	14	30.2	7
2008	35.0	7	36.4	10
2009	22.3	6	26.0	19
2010	27.6	8	29.3	12
2011	23.3	6	26.6	15
2012	32.3	10	36.4	17
2013	26.7	8	33.5	12
2014	25.4	9	27.3	16
Weighted Yield Averages	27.9		29.2	
Sample Size	120		173	

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Take Home

Field history is everything. Consider how this plays into what you observe.

Check hybrid reports. Hybrid ≤100 days (MA 2017 National Corn Yield Contest Winner – 1st place 99 RM, 2nd place 108 RM)

Start gradually – doesn't have to be all or nothing.

You still get SOM and CC benefits. Holding soil and feeding microbes in August! Also improving nutrient cycling + forage.

More $ to be made, less reliance on just corn. If you get a good crop, can sell off higher quality baleage or hay.

PSNT, CSNT, RFV and RFQ – we can help with the snapshot

UMassAmherst

Dr. Masoud Hashemi
Dr. Heather Darby (collaborator)
Dr. Sarah Weis
Neal Woodard
Zach Zenk
Kelly Kramer
Farmer Collaborators

The Center for Agriculture, Food and the Environment

Annie's Sustainable Agriculture Scholarships

Give Your Best To Dear Old Stockbridge · BODY · HEART · SOUL · 1918

NORTHEAST SARE Sustainable Agriculture Research & Education

UMass Extension, Stockbridge School of Agriculture